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The Use of Business Simulations in Post-secondary Business Education in Alberta

by

Stephen Joseph Lamoureux

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Education

in

Instructional Technology

Department of Adult Career and Technology Education

Edmonton, Alberta

Fall 1994

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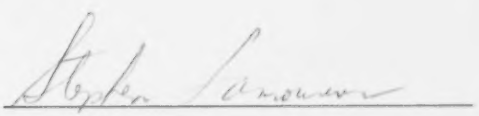

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Dr. J.A. Cameron

James Small

Dr. J. Small

G. McConaghy

Dr. G.W. McConaghy

Date: Sept 21, 1994

Dedication

This thesis is dedicated to my mother, Lena Lamoureux, and my father, Phillip Lamoureux both of whom devoted their careers to the education of young people. It is my hope that through innovative approaches to career development and education, educators will continue to succeed in helping young people prepare for the world of business.

Abstract

Business simulations have been used as a teaching method since 1956; however, little research has been done on their use in Canada. The purpose of this study was to find out the extent to which business simulations are used for management training in post-secondary education in Alberta.

In May 1994, business instructors at one-year certificate and two-year diploma granting post-secondary institutions in Alberta, were surveyed about their use of business simulations. Two hundred and seventy-seven instructors were sent questionnaires. One hundred and fifteen responded for a response rate of 42.1%.

Of the 115 business instructors, 24.3% used a business simulation in the previous school year. Of the non-users, 32.2 % used a business simulation previously. Usage is most common in the accounting discipline, in two-year diploma programs. The most common reason for adopting a simulation is because several instructional alternatives had been evaluated.

Typically, 41.8% of class time is devoted to the business simulation and 34.9% of course grade weighting is assigned to simulation activities. The most common set of basic management skills taught are information-processing skills.

Both users and non-users perceive the teaching of critical thinking skills and student enjoyment as the two greatest advantages of business simulations. Users perceive the lack of a realistic system of rewards and punishments as the greatest disadvantage of business simulations, whereas non-users perceive students' inability to distinguish the differences between the simulation and the real world, as the greatest disadvantage. Previous users perceive both of the above as the two greatest disadvantages.

Users ranked business simulations as the most effective out of four teaching methods (in a tie position with cases), whereas non-users ranked them second. The average rating that users gave their

business simulations on various characteristics was 3.6 of a possible 5.

The typical user is a male, full-time instructor, between 46 and 50 years of age, has 13.8 years of teaching experience at the post-secondary level, has 10.5 years of full-time work experience, specializes in accounting, and teaches at a community college.

The results of this study are compared with Faria's study of business simulation usage in the United States.

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I would like to thank my colleagues, the professors, and staff in the department of Adult, Career and Technology Education. Though the department no longer exists as such, the memories of our shared learning experiences live on.

Finally, I would like to thank my wife, Karen Gray, for her love and support during the three years I devoted to completing this degree.

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Chapter I

Overview of the Problem

Introduction

A concern of educators has been to strengthen the linkages between school and work. One teaching method which has been employed to increase the "real world" relevance of instruction is experiential learning. In programs aimed at developing business/management skills, experiential learning has included co-operative placements as well as the use of business simulations. The purpose of this study was to examine the use of business simulations in post-secondary business education in Alberta.

The use of business simulations as an instructional method first occurred in 1956 when the American Management Association created the "Top Management Decision Simulation" (Watson, 1981). The proliferation of the microcomputer and the migration of business simulation software to a microcomputer format has ensured that business simulations are widely used today for management training in both academia and business.

Business simulations are computer or manually-scored games which simulate either an entire business operation (top management simulations) or one division of the business such as marketing, finance, or production (a functional business simulation). The simulation involves several rounds of play which correspond to a unit of time in the business cycle, such as a month, a quarter, or a year. For each round of play, individuals or teams are required to make several decisions regarding the operation of the firm or division. Feedback on performance is received in the form of reports

or financial statements. In the case of top management simulations, decisions are made in several areas such as production, marketing, finance, and personnel. Students usually form teams which each represents a separate firm. Firms compete with one another for market share and profits. In the case of a functional simulation, all decisions would be made in one functional area such as marketing. Individuals or teams attempt to minimize costs through efficient operation of the functional area (Carson, 1969).

Although studies have been conducted regarding the use of business simulations in the U.S. (Faria, 1987), the U.K. (Burgess, 1991), and Australia (McKenna, 1991), little research has been done on their usage in Canada.

Problem Statement and Research Questions

In this study, a questionnaire was used to determine answers to the following question: What is the extent and nature of usage, perceived advantages and disadvantages, and perceived relative teaching effectiveness, of business simulations in post-secondary business education in Alberta, from the perspective of business instructors in colleges and technical institutes?

Subproblems

1. What is the extent of business simulations usage?
    - 1.1. Usage level in the past 5 years.
    - 1.2. Current usage level, including discipline, program, and class size.
    - 1.3. Estimated future usage.
    - 1.4. Hardware and software used.
    - 1.5. Reasons for adoption.
2. What is the nature of business simulation usage?
    - 2.1. How is play organized?
    - 2.2. What management skills are taught?
3. What are the perceived advantages of business simulations?
4. What are the perceived disadvantages of business simulations (including reasons for discontinuing usage/never using)?
5. What is the perceived relative teaching effectiveness of business simulations?

5.1. Global comparisons among teaching methods.

5.2. Evaluation of characteristics of simulations.

6. How does the profile of a user compare to the profile of a non-user?

7. How does the extent and nature of usage of business simulations, perceived relative teaching effectiveness, and user profiles in Alberta compare to Faria's (1987) study of business simulation use in the United States?

Statement of Significance

In the emerging global economy, the need for decision-makers with sound management training will be crucial (Steering Committee on Prosperity, 1992). Business simulations are often seen as a means of preparing students to meet the challenges of the business world. These simulations provide "hands on" experience which may facilitate the transfer of learning to the job site.

This study was designed to contribute to our knowledge about the use of business simulations in post-secondary education in Alberta. Instructors in post-secondary education should find this information of value when making decisions about experiential learning methods in the field of business. The survey reflects the extent and nature of usage at the various colleges/technical institutes, perceived advantages and disadvantages of using business simulations, and perceived relative teaching effectiveness. This information should assist business instructors in assessing the value of pursuing a simulation-based teaching strategy in business courses.

Delimitations

1. This research focused on the use of business simulations by Alberta post-secondary business instructors in one-year certificate, two-year diploma, and university transfer programs. Business instructors of four-year degree programs were excluded.

2. The study did not seek out the opinion of business administrators regarding business simulations, as was done by Faria (1987).

3. The study did not examine the use of business simulations in business, as was done by Faria (1987) and Burgess (1991).
4. The advantages and disadvantages are based on the instructors' perceptions alone. Students were not polled, as was done by McKenna (1991).
5. Only the opinions of instructors were solicited regarding the relative teaching effectiveness of simulations. Student opinion was not solicited.
6. The study did not perform a cost/benefit analysis of business simulations, which was a research direction identified by Greenlaw and Wyman (1973).

Limitations

1. The proportion of business instructors who use business simulations is relatively small (approximately 17% in four-year colleges in the United States, according to Faria, 1987). Therefore the number of respondents who are users may not be large enough to be able to draw conclusions regarding the user population in Alberta.
2. Business simulation may be an unfamiliar teaching method to some business instructors. Even though a definition was provided in the questionnaire, some respondents may have misinterpreted the definition. Burgess (1991) noted the difficulties attached to the term "business simulation" for both users and non-users.
3. Estimates of future usage of simulations were based on the instructors' opinions and may not be an accurate reflection of what actual usage will be.

Assumptions

1. The questionnaire is a valid instrument.
2. The response rate is sufficient to make the study valid.
3. The instructors answered the questionnaire honestly.

Definition of Terms

Business/Management Simulation: a simulated market environment in which participants make decisions for an imaginary business enterprise in areas such as production, marketing, finance, and human resources in order to maximize output measures such as net profit or return on investment. Computers may play a role in calculating the output measures, given the input decisions of various teams competing in the simulated environment.

Total enterprise simulations (top management games): "simulations that deal with the entire organization, provide a balanced number of decision variables in marketing, production, and finance, and thus require the strategic integration of several subunits for organizational performance" (Keys and Wolfe, 1990, p. 308).

Functional business simulations: "simulations that concentrate on a single subunit of the firm" (Keys and Wolfe, 1990, p. 309).

Outline of the Rest of the Thesis

Chapter 2 - Literature review. This chapter includes the importance of management training in Canada, simulation as a teaching method, advantages and disadvantages of simulations, effectiveness of business simulations as a teaching method, usage of business simulations in other countries including the U.S., the U.K. and Australia, and usage of business simulations in Canada.

Chapter 3 - Methodology. The methodology revolves around the design and implementation of a questionnaire for data collection. The questionnaire includes questions in the following main areas:

a) extent of usage of business simulations, including past, present and future usage
b) nature of usage of business simulations
c) advantages of business simulations
d) disadvantages of business simulations
e) relative teaching effectiveness of business simulations
f) demographics of the instructor and school

Chapter 4 - Presentation of Findings:

a) extent of usage

b) nature of usage

c) perceived advantages

d) perceived disadvantages

e) relative teaching effectiveness

f) profile of users vs. non-users

g) comparison of this study's results to Faria's study

Chapter 5 - Interpretation and Discussion of Findings

Chapter II

Review of the Literature

Introduction

This literature review examines the importance of management training in Canada, simulation as a teaching method, the advantages and disadvantages of simulations, and the results of research into the teaching effectiveness of simulations. It will also examine the results of research into the extent and nature of business simulation usage in post-secondary education outside Canada and within Canada. These topics are addressed from the perspective of how they relate to the research problem which is the extent and nature of usage, perceived advantages and disadvantages, and perceived relative teaching effectiveness of computer-based business simulations in post-secondary business education in Alberta.

Management Training in Canada

In 1992, the Steering Committee on Prosperity, established by the federal government to explore means of ensuring Canada's future economic and social fortunes, recommended that one effective strategy for prosperity would be the creation of a learning culture in Canada. Two challenges recognized by the Steering Committee in implementing the strategy to build a learning culture were: the need to improve the skills of Canadian managers and future managers, and the need to find new ways of using technology to meet the requirements of individual learners.

The use of business simulations at the post-secondary education level is a means of meeting both these challenges. Since business simulations are experiential in nature, it is believed that they facilitate the transfer of knowledge from the classroom to the work place. Future managers apply management principles in a practical, "hands on" way that brings new meaning to their studies. Exploiting the power of computer technology allows for the evolution of the simulations to incorporate such learning aids as Decision Support Systems (Hsu, 1989). DSS is one example of how business simulations may be adapted to meet the needs of individual learners. The learner consults DSS as a management information resource while engaged in the business simulation.

Given the assumption of a need for business simulations in post-secondary education in Canada, what is known about simulation in general as a teaching method?

Simulation as a Teaching Method

Simulation is a unique teaching strategy which allows for experiential learning. Joyce, Weil, and Showers (1992) present a theoretical framework for simulation as a teaching method which, although generally applicable to computer and non-computer based simulations in a variety of disciplines, applies equally to the specific area of computer-based business simulations. The instructor using the simulation, plays four roles: explaining, refereeing, coaching, and discussing. The simulation model itself involves four phases: an orientation, participant training, simulation operations, and participant debriefing. The social system created is an interactive, cooperative environment. The principles of reaction, which describe how the instructor should regard the student and react to what the student does, are: do not evaluate, facilitate the understanding of the rules, encourage participation, and, when necessary, tell the students to get on with the game. The support system consists of the structured resource materials, which, in the case of the business simulation, include the computer program and the instructional manuals.

A key facet of simulation as a teaching method is the notion of play and fun. Willis, Hovey, & Hovey (1987) note that ethologists, who study the behavior of animals in their natural environment, regard play as a natural behavior which is essential for learning and

development. This applies equally to dogs as it does to humans. Simulations provide such environments for play and learning. Three factors are required to make games "fun", an essential characteristic required to facilitate learning: challenge (i.e. having a goal whose outcome is uncertain), fantasy, and curiosity (i.e. novel and surprising) (Malone, 1980).

When simulation is combined with the power of the computer, what emerges is a microworld. Papert (1980) coined the word "microworld" to describe a computer-based learning environment which serves as an incubator for knowledge. LOGO is one such environment, where Turtles are depicted as transitional objects on a computer screen. By manipulating the Turtle's position using the LOGO programming language, children learn mathematical concepts.

Senge (1990) elaborates on the idea of the microworld:

> The doll, the blocks, the swing, and teeter-totter are what educational theorists call "transitional objects"; the playroom or the playground is a microworld, a microcosm of reality where it is safe to play. Through experimentation with transitional objects in microworlds, children discover principles and develop skills that are relevant in reality beyond play. (p. 314)

Senge applies the concept to learning managerial skills. Microworlds enable managers to learn through doing as a result of the compression of space and time within the microworld. Few microworlds capture the complexity that confronts managers; however, the power of the personal computer allows for the integration of complex team interactions and complex business interactions. Microworlds therefore allow for relevant play by managers (or managerial students) in such areas as managing growth, product development, or improving quality.

Advantages and Disadvantages of Simulations as a Teaching Method

Willis et al. (1987) specify numerous advantages of simulations as a teaching method. Simulations are described as fun (which was expanded on, above), an inexpensive alternative to a field placement, a safe environment for experimentation, realistic, a way to provide for better transfer of learning, inexpensive to develop, resulting in less threat and anxiety for the learner than other educational

activities, a tool to teach critical thinking skills (through the use of "what if" scenarios) as well as content, a way to encourage socialization and collaboration, and finally an approach that maximizes use of learning time (through a focus on the specific learning task).

Some potentials disadvantages of using simulations as an instructional tool include the fact that students may not realize there are substantial differences between the simulation and the real world, simulations take up more time than their learning objectives justify, and simulations emphasize violence and competition. With respect to the time demands, simulations may monopolize class time due to their intrinsically motivating nature. This may lead the instructor to consider less time-demanding alternatives. With respect to violence and competition, some instructors may feel that these aspects of popular adventure games detract from their educational value (Willis et al., 1987).

An additional disadvantage identified by Roberts (1969), is the lack of a realistic system of rewards and punishments. By this he means that the learners may not treat the simulation seriously, since the consequences of not performing well are far less grave than in real life.

The above advantages and disadvantages apply equally to computer-based business simulations with one exception. A key component of business in the real world is competition among firms. Therefore, business simulations must balance cooperation within a team, with inter-team competition.

Effectiveness of Business Simulations as a Teaching Method

Much research has been done in the area of the teaching effectiveness of simulations. A review of research on the teaching effectiveness of simulations in general was conducted by Dekkers and Donatti (1981). In addition, Foster (1984) examined two reviews of studies into the teaching effectiveness of computer simulations.

Two comprehensive reviews, one by Greenlaw and Wyman (1973) and one by Wolfe (1985), were done on the effectiveness of computer-based business simulations as a teaching method. In

addition, Hsu (1990) examined the two reviews and drew conclusions.

Dekkers and Donatti (1981)

Dekkers and Donatti conducted a meta-analysis of 93 studies, all of which reported the difference in posttest scores between an untreated control group and an experimental group involved in simulations (including non-computer simulations). Dekkers and Donati grouped the studies into three types (cognitive, retention and attitudinal) and compared the means of the mean postscores for the experimental and control groups. They concluded that simulations do not result in increased cognitive development or retention when compared to other methods. However simulations do appear to improve attitudes when compared to the lecture method.

Foster (1984)

In examining the work of Hunter and Clark (1977) and Bredemeier and Greenblat (1981), Foster also concluded that simulations are not any more effective that other teaching methods. Hunter and Clark (1977) reviewed studies which made various claims about the effectiveness of simulations. They found that the research design for the majority of the studies was weak, and that the findings were questionable due to confounding variables. Bredemeier and Greenblat (1981) suggested that the effectiveness of simulations depends on a host of circumstances such as the outcome(s) being examined, the shape of the experience (including administrative variables, internal simulation variables, and group variables), and the nature of the learners (personality, learning style, game ability, and academic ability).

Greenlaw and Wyman (1973)

Greenlaw and Wyman reviewed 22 research studies, conducted from 1961 to 1972, with a specific focus on business simulation learning to meet collegiate course objectives. These included 13 general management simulation studies as well as 9 functional simulations (in the areas of marketing, finance, and accounting). The studies addressed one of two issues: the simulation's teaching effectiveness relative to an alternate teaching method (usually the case study method), or internal factors related to effectiveness (which might

include factors related to the players, the instructor, or the simulation itself). The authors concluded that: "Although games have been an extremely popular and widespread teaching tool, very little 'hard' research has been done on gaming -- especially concerning what players learn to meet course objectives, which was our prime interest" (pp. 289-290). They also suggested that performance based on computer outputs, which was the focus of several of the studies reviewed, may not be an adequate measure of the learning that has occurred. In other words, poor performance may not reflect an absence of learning, while good performance may not reflect superior learning.

The direction for research suggested by Greenlaw and Wyman was to clarify incongruencies in the existing research, for example, whether providing information on the operation of the simulation enhances learning; improve measurements of variables in order to compare simulations to other teaching strategies; and design research according to the following steps: define course objectives, choose a simulation to meet those objectives, and develop "hard" measures of learning including a cost/benefit analysis.

Wolfe (1985)

Wolfe provided an update of the Greenlaw and Wyman review, reviewing 39 research studies on the teaching effectiveness of business simulations, which were conducted between 1973 and 1983. These studies included research on 23 general management simulations and 16 functional simulations (in the disciplines of accounting, collective bargaining, economics, finance, international management, management principles, and marketing). Wolfe concluded that: "Because of the wide differences in classroom practices and the range of games evaluated, it can be seen why it is difficult to make clear statements about business gaming effects" (p. 274).

Wolfe also drew conclusions regarding the influence on effectiveness of game design characteristics, administration characteristics, player and group characteristics, and administrator characteristics. With regards to game design, top management games appear to be valid. However, the influence of support materials, degree of realism, and random events on effectiveness are unclear. With regards to administration, there is no research into the effect of starting

position, team accountability, pacing, and trial or practice runs. Larger team size appears to increase game performance, the effect of duration is game specific, and the research into learning objectives has focused on basic knowledge and comprehension. With regards to player and group characteristics, aptitudes and benefit derived from simulations are positively correlated and simulations change attitudes about the simulations themselves. No research has been done on which team structure is best for learning. With regards to administrator characteristics, no research has examined the influence of an instructor's subject familiarity on simulation-related learning.

The direction for future research prescribed by Wolfe included a need for standardized reporting procedures, and a need for recognition of research which has already been conducted. He stated further that: "Rather than simply testing whether games teach, the field should adopt a contingency approach. Research must attempt to understand the environmental conditions and factors that make games more or less effective." (p. 282). In addition, research into business simulations needs to go beyond the factors that enhance within-game performance, and examine the factors influence actual learning.

Hsu (1989)

Hsu examined the 61 studies reviewed by Greenlaw & Wyman and Wolfe and divided them into five general categories. He stated that previous research has been inconclusive in the categories of comparison to conventional delivery, game performance, and external validity. (External validity, in this case, refers to determining whether performance on a business simulation is predictive of future performance as a manager.) He also stated that the previous research has been conclusive in the categories of group processes (team organization and interaction) and experiential learning. With respect to group processes, Hsu suggested that greater emphasis should be placed on group structure in the design of management games. Learning depends upon group structure, group interaction, as well as the availability of group communication facilities and group decision support aids. With respect to experiential learning, Hsu suggested that management games help learners solve problems in ambiguous situations.

Further, Hsu concluded: "...it is most effective to adopt the management games to acquire managerial, technical, and problem-solving skills, based on the experiential learning principles." (p. 433). In other words, simulations are a poor substitute for the case method and lectures when delivering facts and concepts, but appear to be effective when used to apply general principles in a practical, "hands on" situation.

In summary, the research into the teaching effectiveness of simulations has for the most part been inconclusive. This may be due to the fact that the comparisons being made were not relevant, given that simulations have the greatest impact in different learning situations from, for example, lectures or case studies. What may be concluded is that business simulations are best used in teaching situations calling for experiential learning of managerial skills including group process skills such as peer communication or leadership.

Use of Business Simulations outside Canada

Much research has been done on the status of business simulations in post-secondary education outside Canada, including usage and relative teaching effectiveness.

The United States

Faria (1987) conducted a survey of the use of both non-computerized and computerized simulations, with faculty of business deans having membership in the American Assembly of Collegiate Schools as well as with business instructors of various business disciplines. The survey of deans revealed that 95.1% of the business schools report the use of computer-scored business simulations. (This compares to 71.1% reported by Dale and Klasson in 1969 and 94.5% reported by Roberts and Strauss in 1975.) This reflects rapid growth in usage between the late '60's and mid-70's, followed by a period of stabilization.

The business deans also reported that business simulations were used most frequently in business policy and marketing courses, and more frequently at the undergraduate than graduate level. An increase in usage in the last 5 years was reported by 63.4% of the deans, while only 4.9% estimated that usage would decrease in the

next 5 years. Nearly one third (31.3%) indicated that their students participate in intercollegiate simulation competitions. Business simulation use in the school's executive development programs was reported by 44.9% of the deans. Finally, business deans ranked business simulations second to cases in terms of teaching effectiveness; lectures, and textbooks ranked third and fourth, respectively.

Of the business instructors surveyed, 17.3% were currently using business simulations in any course. Of the non-users, 12.9% had previously used business simulations; one reason for discontinuing usage was changes in the courses taught. Among users, an average of 29% of class time was spent using the simulation; the average grade weight for simulations was 24% (rounded to the nearest percentage). 89.4% felt that usage of simulations had remained the same or increased over the past 5 years. 91.5% expected that usage would remain the same or increase in the next 5 years. Business instructors ranked business simulations third in terms of teaching effectiveness, among lectures, cases, simulations, and reading.

Faria concluded that business simulation usage peaked in the mid-70's and has remained constant ever since. Room for growth exists since 70% of instructors have never used business simulations. This is particularly true in the disciplines of finance, management, and accounting.

In summary, business simulations are used extensively in the U.S. and are perceived to be an effective teaching method.

The United Kingdom

Burgess (1991) used a survey to examine the use of computerized management and business simulations in the United Kingdom. Within academia, polytechnics had the highest level of usage at 92%. As might be expected, users found simulations more valuable than non-users. Usage was predicted to remain the same or increase over the next two years. Reasons given for predicting a decrease in usage included that simulations take up too much time, they require too many resources, and that the simulation previously used was replaced with a new one.

An average of 3.2 simulations were used per school, each having been used for an average of 7.5 years. In-house verses purchased simulations were split 50/50. Postexperience courses (the equivalent of extension courses in Canada) represent the largest category of use. Microcomputers were used for scoring over 80% of the simulations.

Burgess compared his data to Faria's and concluded that a comparable level of usage occurs in business and management departments. However, usage in the U.K. occurs at the postexperience level, while in the U.S. it occurs at the undergraduate level. Predicted usage is high in both the U.K. and the U.S.

Australia

McKenna (1991) surveyed instructors of business strategy or similar courses on the use of computerized business simulations. One of the intents of the survey was to examine the slow adoption and low usage rates of simulations in Australia. The results indicated that over half of the schools surveyed use simulations. Of the 18 different simulations used, only 2 were Australian. Simulations were used in conjunction with two or three other methods of instruction, indicating a strong support for using simulations with other teaching methods. Users ranked simulations first among seven teaching techniques. Relative to other teaching techniques, simulations are enjoyable, require participants to make a balanced set of decisions, provide adequate information, and facilitate "what if" analysis.

From his data, McKenna concluded that the simulations may not be representative of the Australian business climate which may have contributed to the slow adoption by Australian business instructors.

Use of Business Simulations in Canada

Keeffe, Dyson, and Edwards (1993) surveyed 180 business professors in four year undergraduate programs regarding the use of general management simulations in strategic management and business policy courses. The study covered 40 states as well as Canada, however, separate data were not reported for Canada. The results indicated that usage had decreased from 48.4% in 1985 (Keeffe and Cozan) to 46 % in 1990. Approximately half of the professors surveyed used business simulations, while the other half used case

studies. Newer professors have been more reluctant to adopt simulations as a teaching method. Seventy-four percent of simulation users assigned a grade to game performance. The value of simulations was seen to be in teaching strategic implementation, evaluation, and control concepts rather than strategy formulation concepts. The reasons given for discontinuing use of simulations included logistical and administrative considerations as well as time constraints.

Keefe et al. (1993) called for a dialogue between users and non-users, in order to overcome the limitations of simulations and to examine their impact on learning.

Other than the Keefe et al. (1993) study, there is very little published regarding the use of business simulations in Canada.

Concluding Remarks

There is a need in Canada for both managerial training and for training to be delivered in more flexible ways. Simulation is an effective method of allowing for experimentation and play in a safe environment. Business simulations allow for such experimentation and play among managers and managerial students. Although research exists on the extent of business simulation use in the U.S., Australia and the U.K., little research has been done in Canada. Therefore, the time is ripe for a study on the usage, perceived advantages and disadvantages, and perceived relative teaching effectiveness of business simulations in Canada. More specifically, this study examines business simulation usage in post-secondary business education in Alberta.

Chapter III

Methodology

Introduction

This chapter addresses research methodology. The exploratory research which was conducted is described, the study sample and population are identified, the development, validation, and pilot testing of the questionnaire is described, the organization and administration of the questionnaire is outlined, and the data analysis and presentation is summarized. Also, the research questions are examined individually, according to data collection, analysis, and presentation. Finally, ethical concerns are addressed.

In short, a quantitative study was undertaken, using a questionnaire as the sole means of data collection. How this questionnaire was developed, how it was administered, and how the data was analyzed, is the subject of this chapter.

Exploratory Research

The researcher's experience with business simulations had been limited to the findings of the research literature. It was felt that a first-hand examination of existing business simulation products would give the researcher a more realistic perspective from which to design his study. Therefore, the researcher reviewed eight computer-based business simulations available through the curriculum section of Coutts Educational Library at University of Alberta. This review consisted of examining the strengths and weaknesses of each simulation, as well as any unique features.

These simulations, which are targeted at elementary and secondary students, included Free Enterprise, Whatsit Corporation, Enterprise Sandwich Shops, Cosmic Carnival, Sounds Abound, Millionaire II, Marketplace, and Music Boosters. The researcher also reviewed Venture's Business Simulation and Threshold which are targeted at the home market and the post-secondary market, respectively. In addition, the researcher engaged in several rounds of play of both Enterprise Sandwich Shops and Venture's Business Simulation.

The researcher contacted a publisher who services the post-secondary market regarding the extent of business simulation usage. Also, the researcher met with an instructor at each of the Faculty of Business at University of Alberta, Grant MacEwan, and NAIT, including two current users of business simulations and one previous user. The simulation formerly used by the university professor was a top management simulation, The Business Policy Game, which is scored on a PC. The simulation in use at Grant MacEwan was a marketing game, Marketing In Action, which is scored on a VAX minicomputer (which has since been replaced by a PC simulation, Airline). The simulation in use at NAIT was a finance game, FinGame, which is scored on a mainframe computer.

The researcher contacted the Society of Management Accountants of Alberta regarding BusComp, an annual two-day competition among post-secondary accounting students from across Alberta. The competition has a case study component as well as a business simulation component. In 1994, teams were entered from 12 colleges.

Finally, the researcher participated in a five-day management development workshop which revolved around a top management business simulation. The workshop format allowed for a first-hand experience with a simulation in a relatively condensed time frame.

Study Sample and Population

The population of this study was post-secondary business instructors who teach in programs which lead to a one year certificate, two year diploma, or university transfer in business administration. Excluded were business instructors who teach in programs which lead to a four year degree in business administration. The reasons for focusing on colleges and technical institutes were twofold: first, to

narrow the scope of the study and second, because the Adult, Career and Technology Education department's links with higher education in the province are strongest with the community colleges and technical institutes.

The sample was the same as the population. The total population of post-secondary business administration instructors of certificate, diploma, and university transfer programs in Alberta is approximately 273. (Note that an additional 250 business administrations instructors teach at the four universities in Alberta.) Institutions offering business administration or equivalent programs were identified in the Post-Secondary Education Programs (1993-1995) booklet provided by Alberta Advanced Education and Career Development. The names of the instructors were obtained from the current calendars of the educational institutions (see Appendix D for a list of institutions surveyed).

It was necessary to survey a large number of business instructors since the estimated proportion who use either top management or functional business simulations was small. (Faria, 1987, found 17% of business instructors at four year colleges used business simulations. Conceivably, their usage could be even smaller in one and two year colleges.)

Development and Validation of the Questionnaire

One questionnaire was used to gather data from business instructors, including both business simulation users and non-users. This questionnaire was a modification and elaboration of the one used by Faria (1987) with business instructors in his study of American business schools (see Appendix A for a copy of the questionnaire).

The questionnaire was given to two Business Faculty professors at University of Alberta for validation. One professor was a current business simulation user, while the other was a previous user. They were asked to examine the instrument with respect to the relevance of the content. They reported that a definition of business simulation should be provided to narrow the focus of the questionnaire, that users of more than one simulation should be accommodated, that questions regarding economic reality should focus on Alberta rather than Canada, that management skills should be defined more broadly so that the respondent is encouraged to

define skills in the categories provided, and that asking for the respondent's degree of familiarity with computers may discriminate between users and non-users and therefore should be captured in the demographic information. These concerns were addressed by revising the questionnaire.

The revised questionnaire was piloted with one user and one non-user at each of Grant MacEwan and NAIT. The researcher was present when the instructors completed the questionnaire, and noted difficulties they had in doing so. The instructors were interviewed afterwards to ascertain possible improvements to the wording or organization of the questionnaire. As a result, the following changes were made:

1) an initial question was added to evaluate the participant's familiarity with business simulations (question 1.1);
2) question 3.1 regarding the effectiveness of teaching methods was put into a specific context;
3) question 4.2 was changed to request reasons for never having used a simulation as well having discontinued usage;
4) "increase in quality of software" was added as a reason for adopting a simulation (question 4.3);
5) extension programs were divided into two categories: credit and non-credit (question 5.3);
6) the number of students using the simulation was divided into total students in all sections, and the average in each class (question 5.4);
7) "purchased off-the-shelf and modified" was added as a possible method of acquiring the simulation (question 5.5b);
8) the introduction to Section 6, questions 6.1a), 6.2a), and 6.3, were modified to clarify that the context is the simulation course (vs. the program of study);
9) question 6.1b) was added to determine the percentage of the program's class time devoted to a simulation seminar;
10) question 6.5 concerning the number of students per team was divided into two: minimum and maximum;
11) the meaning of rounds of play was clarified (question 6.6);
12) the evaluation of the characteristics of the simulation used was simplified, removing the relative comparison with other teaching methods (question 6.10);

13) the respondent's age was divided into 10 possible categories (question 7.2);

14) the meaning of work experience was clarified (question 7.4);

15) question 7.5 was changed to ask the nature of the instructor's role (full-time vs. part-time, instructional vs. administrative) rather than just the percentage of time spent in teaching;

16) the areas of specialization were altered from a university-based list to a community college/technical institute-based list (question 7.6).

Organization of the Questionnaire

The questionnaire was divided into 7 sections. Users completed Sections 1 through 3 and Sections 5 through 7. Non-users completed Sections 1 through 4 and Section 7.

Section 1 identified perceived advantages of business simulations.

Section 2 identified perceived disadvantages of business simulations.

Section 3 identified perceived relative effectiveness of various teaching methods, including simulation, and distinguishes between users and non-users.

Section 4 identified previous users, asked for reasons for discontinuing use/never using, asked for reasons why a non-user might adopt/readopt a business simulation, and asked whether the non-user has plans to implement or investigate simulations.

Section 5 identified the extent of usage.

Sections 6 identified the nature of usage. The last question in this section asked the respondent to evaluate characteristics of the simulation used.

Section 7 identified demographic information about the instructor and the institution at which he/she teaches.

Administration of the Questionnaire

The questionnaires were sent out May 9, 1994. The provincial government courier which operates among all public post-secondary educational institutions was used for those business instructors at public institutions. Regular mail was used for those business

instructors at private colleges (see Appendix B for a copy of the covering letter).

A follow-up was sent two weeks after the initial mailing as a reminder to all individuals in the sample (see Appendix C for a copy of the reminder letter).

Data Presentation and Analysis

The primary method of data analysis was to tabulate frequencies of occurrences and present counts and percentages. SPSS was used to facilitate data analysis, including the multiple dichotomy function which allows for the tabulation of results of questions which have more than one possible answer.

Analysis for the questions dealing with the names of the business simulations used and the publisher was done qualitatively; it was not possible to anticipate the multitude of answers possible, therefore, these questions were left open-ended. The reasons for discontinuing use of/never using a business simulation were also analyzed qualitatively; this question was also left open-ended to allow for a comparison with perceived disadvantages.

Means and standard deviations were also calculated where appropriate.

t-tests were applied to determine if there is a significant difference in the ratings of teaching methods between users and non-users. t-tests were also applied to determine if there is a significant difference in teaching experience, work experience, self-ratings on familiarity with business simulations, and self-ratings on familiarity with computers and software, between users and non-users.

Chi-square analyses were done to test for interactions between usage and gender, usage and age category, usage and educational role, and usage and type of institution.

Subquestions - Data Collection, Analysis, and Presentation

The question which was used to guide the research was: "What is the extent and nature of usage, perceived advantages and disadvantages, and perceived relative teaching effectiveness, of business simulation

in post-secondary business education in Alberta, from the perspective of business instructors at colleges and technical institutes?"

The 7 subquestions identified in Chapter I were used to develop the 7-part questionnaire for this study. In this section, the method for collecting data for each subquestion is described, as well as data analysis and presentation.

Subquestion #1

What is the extent of usage of business simulations?

Section 3, question #3.2 established whether the respondent uses a business simulation. Section 4, question #4.1 established whether the non-user has used a business simulation previously. The frequencies of current usage and of previous usage are presented as both counts and percentages.

Section 5 collected data on the user's reasons for adopting a simulation (based on McKenna, 1991); what discipline, program, and class size the simulation is used in; and the nature of the business software and hardware used. Finally, they were asked whether usage has increased, and whether it will increase in the future. These questions generally correspond to Faria's questions of business instructors on extent of usage, allowing for a comparison. The frequencies of these data are also tabulated as both counts and percentages, with the exception of class size which is presented as a mean.

Questions #4.3-4.5 in Section 4 gathered data on reasons that might motivate the non-user to adopt/readopt a business simulation as well as whether he/she plans to implement or investigate the use of a business simulation in the next school year. The frequencies of reasons for adoption are tabulated as both counts and percentages. The frequencies of implementation and investigation are also tabulated as both counts and percentages.

Subquestion #2

What is the nature of business simulation usage?

This subquestion was addressed in Section 6, questions #6.1-6.9, which was completed by users. First, business instructors were asked a number of questions regarding how play is organized, including the proportion of class time used and the course grade weighting assigned to the simulation. These two questions correspond to Faria's study (1987), allowing for a comparison. Instructors were then asked what other teaching methods are used in conjunction with simulation. This question is base on McKenna (1991). They were also asked at what point in the course the simulation is used, the size of teams, the number of rounds, the interval between rounds, and the number of decisions per round.

The proportion of class time used, the course grade weighting, the size of teams, the number of rounds, the interval between rounds, and the number of decisions per round are summarized as means. The frequencies of the change in the proportion of class time used, the change in course grade weighting, other teaching methods used, and the point in the course when the simulation is used, are tabulated as both counts and percentages.

Second, the simulations users were asked what skills are taught (question #6.9). The eight choices are based on Mintzberg's (1980) roles of managers. The frequencies of the skills are tabulated as counts and percentages.

Subquestion #3

What are the perceived advantages of business simulations?

This subquestion was addressed in Section 1. Respondents were instructed to check all advantages that apply. The list of advantages are taken from Willis et al. (1987). An "Other" category allowed one additional advantage to be listed. Frequencies of advantages are tabulated separately for users and non-users as both counts and percentages. Percentages do not add up to 100% due to multiple entries.

Subquestion #4

What are the perceived disadvantages of business simulations, including reasons for discontinuing usage?

This subquestion was addressed in Section 2 and question #4.2 in Section 4. The list of disadvantages in Section 2 are based on Keeffe et al. (1993), Faria (1987), Willis et al. (1987), and Roberts (1969). An "Other" category allowed for one additional disadvantage to be listed. Frequencies of disadvantages are tabulated separately for users, previous users, and non-users, as both counts and percentages. Percentages do not add up to 100%, due to multiple entries.

Question #4.2 established why the previous user discontinued usage and why the non-user has never used a simulation. The open-ended answers are categorized into themes, and frequencies are reported as counts and percentages.

Subquestion #5

What is the relative teaching effectiveness of business simulations?

This subquestion was addressed in Section 3 and question #6.10 in Section 6. In Section 3, both users and non-users were asked to rate the effectiveness of four different teaching methods on a scale of one to ten. This question is modeled after a question from the Faria (1987) and McKenna (1991) studies; a comparison to Faria is made. Means of the ratings were calculated and are reported separately for users and non-users. A t-test was applied to the all four pairs of means to determine if there is a significant difference in the ratings between users and non-users.

Business instructors who use simulations were requested to respond to an additional question in Section 6: they were asked to evaluate characteristics of the simulation they use, on a scale of one to five. This question is based on McKenna (1991). The mean ratings are tabulated.

Subquestion #6

How does the profile of a user compare to the profile of a non-user?

This subquestion was addressed by combining current usage information from question #3.2 with demographic information in Section 7. The demographic information includes the instructor's years of teaching experience at the post-secondary level and years of full-time work experience. This demographic information of users vs. non-users allows for a comparison to Faria (1987). Means are reported separately for users and non-users. A t-test was applied to both pairs of means to determine if there is a significant difference in teaching experience and work experience between users and non-users.

Additional demographic information includes gender, age category, educational role, area of specialization, type of post-secondary educational institution taught at, familiarity with business simulations, and familiarity with computers and applications software. Frequencies of gender, age category, educational role, specialization, and type of institution are tabulated as both counts and percentages. This is done separately for users and non-users to allow for comparison on these five additional criteria. Chi-square analyses were done to test for interactions between usage and gender, usage and age category, usage and educational role, and usage and type of institution.

The means of the familiarity ratings are reported separately for users and non-users. t-tests were applied to determine whether there is a significant difference in self-ratings between users and non-users.

Subquestion #7

How does the extent and nature of usage of business simulations, perceived relative teaching effectiveness, and user profiles in Alberta compare to Faria's (1987) study?

Faria's study was used for comparative purposes because it is one of the two studies mentioned in Chapter 2 that dealt with both top management and functional business simulations, which was the focus of the Alberta study. In addition, the Faria study was North

American based. Differences between the Faria study and the Alberta study include that the former was a study of American four year degree granting business schools, and the latter was a study of Alberta one year certificate, two year diploma, and university transfer business administration programs.

The results of the two studies are compared in nine areas: current usage, previous usage, discipline used in, change in past usage, projected change in future usage, percentage of class time used, percentage of course grade assigned to simulation, relative teaching effectiveness of various teaching methods, and user and non-user profiles. Frequencies and means are presented side-by-side in order to allow a comparison. Statistical tests comparing results of the two studies were not done because of the differences in the populations surveyed in the two studies.

Ethics

Guidelines regarding the rights of human subjects were followed: participants were fully informed of the purpose of, and process involved with the study; as well as the fact that their participation was voluntary and they may have chosen to discontinue participation at any time. They were also be assured that the anonymity of all respondents would be maintained in reporting the results of the study. These ethical issues were addressed in the questionnaire's covering letter and the follow-up letter (see Appendices B and C).

Chapter IV

Presentation of Results

Introduction

This chapter reports the results of the study. These include the extent of usage of business simulations, the nature of usage, the perceived advantages, the perceived disadvantages, the perceived relative teaching effectiveness, a comparison of the profile of a user with that of a non-user, and the comparison of this study's results with Faria's study. Data were analyzed and are presented in both tabular and graphic form.

Two hundred and seventy-seven surveys were sent out, of which four were returned indicating that the instructor had not taught during the past year, thus eliminating them from the sample. Of the remaining 273, 115 valid surveys were returned, for a return rate of 42.1%.

The Extent of Usage

Of the 115 respondents, 28 (24.3%) were users of business simulations and 87 (75.7%) were non-users of business simulations. Of the non-users, 28 (32.2%) were previous users (used a business simulation prior to the 1993/94 school year) and 59 (67.8%) had never used a business simulation before.

Table 1: Simulations Used

	Publisher	Discipline	Com puter-scored ?	Count	%
FinGame	Irwin	Finance, accounting	yes	5	17.9
Business Management Laboratory	Irwin	Business policy, management, marketing	yes(1) no(2)	3	10.7
Business Policy Game	Prentice Hall	Mgt, bus policy	yes	2	7.1
CAD	McGraw Hill (Foundations of Marketing - Summer & Barnes)	Marketing	yes	1	3.6
Stratplan	Prentice Hall	Business policy	yes	1	3.6
Fiscal	custom-designed	Fin, mgt, acctg	no	1	3.6
Airline	Prentice Hall	Business policy	no	1	3.6
Collective Bargaining Game	developed in house	Labour relations	no	1	3.6
Squaring Off	co-authored	Human resources	no	1	3.6
Futuresim	Alberta Agriculture	Marketing	yes	1	3.6
Sales Management Simulation	John Wiley & Sons	Marketing	yes	1	3.6
Altasim	University of Alberta	Management	yes	1	3.6
Enterprise Sandwich Shops	McGraw Hill	Business policy	yes	1	3.6
*Comm-Write	developed in house	Communications	no	2	7.1
*First Choice Carpets Inc.	Blue Sky Publishing (Edmonton)	Accounting	no	1	3.6
*Mountain Carpets	Blue Sky Publishing (Edmonton)	Accounting	no	1	3.6
*Accpac Plus - Computerized Accounting	Irwin	Accounting	no	1	3.6
*Various micro-applications in accounting and management	not specified	Management, accounting	yes & no	1	3.6
*Project development	developed in-house	Mgt, acctg, info systems	no	1	3.6
*Pine Tree Resorts	Copp Clark	Office procedures, org behaviour	no	1	3.6
Total				28	100%

*Although the respondents identified these products as business simulations, they may not conform with the definition provided in the introduction to the survey.

Table 1 lists the names of the business simulations used, as well as the publisher (if applicable). The most common simulation in use was FinGame, published by Irwin (five users). Business Management Laboratory, also published by Irwin; Business Policy Game, published by Prentice Hall; and Comm-Write, developed in-house, were also common simulations in use (three users, two users, and two users, respectively).

Although the respondents identified 20 different products as business simulations, six of the products may not conform with Carson's definition which was provided in the introduction to the survey. Two criteria were applied to determine if the product conformed with Carson's definition: 1) does the student assume a decision-making role?, and 2) does the student manage an entire business operation or one functional area of the business?

Comm-Write is used to develop written communications skills, although some management skills are involved as well. Since communications is a cross-functional management skill rather than a functional business area, Comm-Write would be better classified as a simulation exercise used in a business administration program, rather than a business simulation.

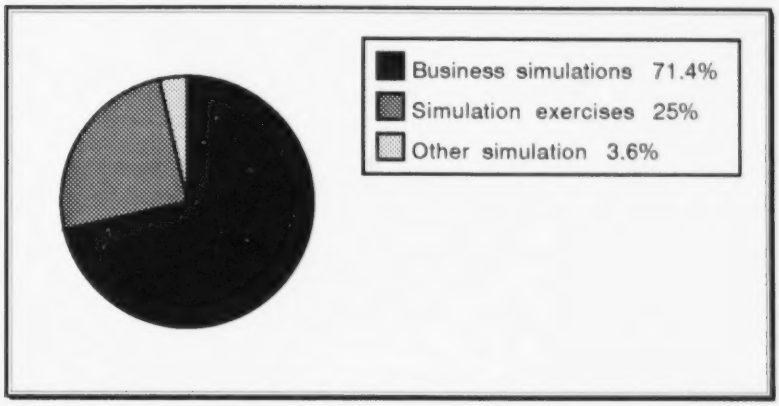
First Choice Carpets and Mountain Carpets develop accounting skills but the student plays the role of accountant, not manager. Therefore, these two would also be better classified as simulation exercises. AccPac Plus - Computerized Accounting, is a text accompanied by a simulation exercise which demonstrates how to use AccPac accounting software. Again the role of the student is that of accountant rather than manager.

"Various micro-applications in accounting and management" appears to be computerized exercises using common application software as management decision-making tools. Although a spreadsheet may be used to perform "what-if" analysis, this function alone does not constitute a business simulation (Burgess, 1991). "Project development - home-grown" appears to be a simulation exercise in which the student develops management, accounting and information systems skills, but it is not clear that the student assumes the role of manager of the entire business or some function of the business.

Finally, Pine Tree Resorts is used in teaching office procedures and organizational behavior. Additional information from a publishing

representative, indicated that Pine Tree Resort is a simulation for office administration students, not business administration students, and therefore is definitely not a business simulation (Questions 5.5a and 5.5c, Appendix A; Figure 1).

Figure 1: Simulations Used



As a result of the apparent distinctions among simulation products, two levels of analysis were conducted with respect to the research subproblems. In the first level of analysis, respondents were classified as users based on their answer to question #3.2 alone. Therefore, users of all 20 simulation products, including Pine Tree Resorts, were treated as a homogeneous group. In the second level of analysis, users of products which appeared to be simulation exercises rather than business simulations according to Carson's definition, were placed in a separate category. This included the users of five of the six products mentioned above. Pine Tree Resorts was excluded from the second level of analysis as it was not used in a business administration program. This second level of analysis revealed significant differences between business simulations and simulation exercises in three areas: 1) program in which the simulation is used, 2) rounds of play, and 3) characteristics of the simulation used.

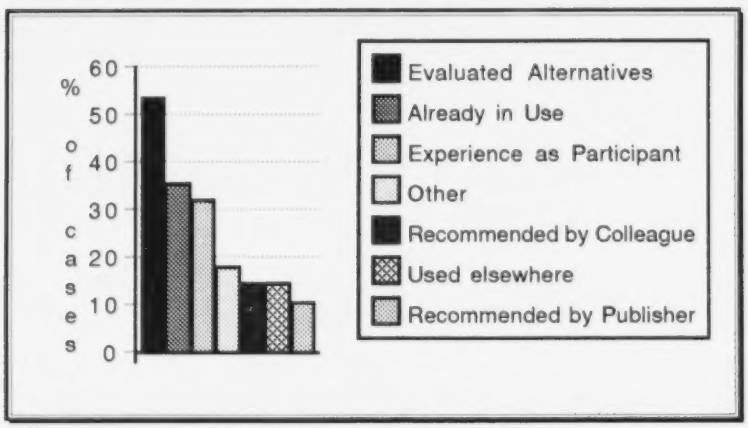
Therefore, the results reported here regarding the research subproblems, generally are those of the first level of analysis. However, results of the second level of analysis are reported where significant differences between business simulations and simulation exercises were apparent.

The most frequently cited reason by users for adopting a business simulation was the evaluation of several instructional alternatives (53.6% of cases). Other reasons cited in over 30% of the cases were the simulation was already in use when the instructor assumed control of the course and experience as a participant (Question 5.1, Appendix A; Table 2; Figure 2).

Table 2: Reasons for Adoption (Users)

	Count	%	
		of Responses	of Cases (28)
Evaluated alternatives	15	30.0	53.6
Already in use	10	20.0	35.7
Experience as participant	9	18.0	32.1
Other	5	10.0	17.9
Recommended by colleague	4	8.0	14.3
Used elsewhere	4	8.0	14.3
Recommended by publisher	3	6.0	10.7
Total	50	100%	178.6%

Figure 2: Reasons for Adoption (Users)

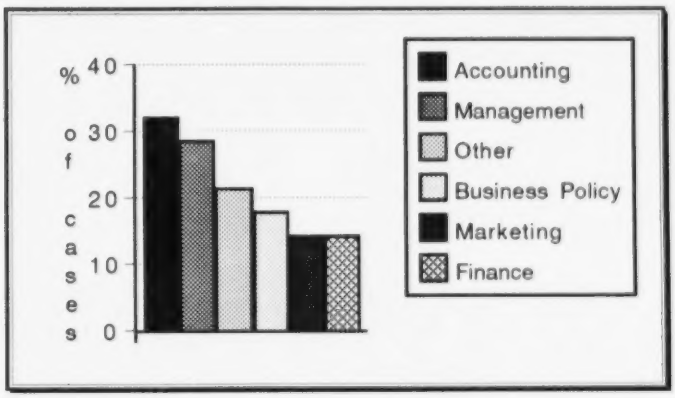


The most common discipline that a business simulation is used in was accounting (32.1 % of cases), followed closely by management (28.6%). Note that although respondents were asked to check only one discipline, due to the number of multiple responses, this item was analyzed using the multiple dichotomy function (Question 5.2, Appendix A; Table 3; Figure 3).

Table 3: Discipline in Which Simulation is Used

	Count	%	
		of Responses	of Cases (28)
Accounting	9	25.0	32.1
Management	8	22.2	28.6
Other	6	16.7	21.4
Business policy	5	13.9	17.9
Marketing	4	11.1	14.3
Finance	4	11.1	14.3
Total	36	100%	128.6%

Figure 3: Discipline in Which Simulation is Used

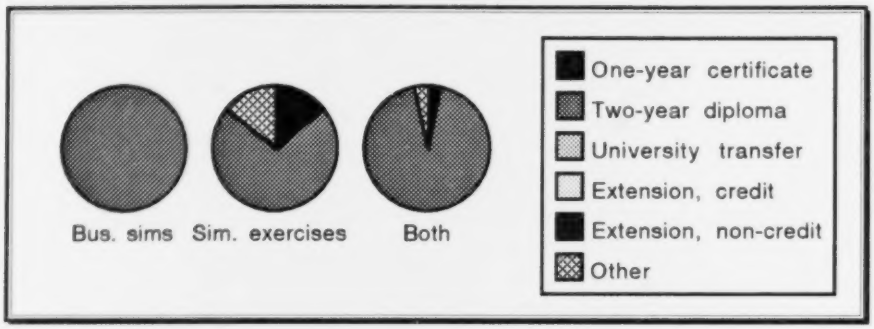


By far the most common program in which simulations are used was the two-year diploma program (92.6% of users). A chi-square test determined that there is an interaction between the program in which the simulation is used and the category of simulation (business simulations vs. simulation exercises, $X^2(2) = 6.2$; $p<.05$). Simulation exercises were used more broadly across programs types than business simulations (Question 5.3, Appendix A; Table 4; Figure 4).

Table 4: Program in Which Simulation is Used

	One-year certificate	Two-year diploma	University transfer	Extension -credit	Extension non-credit	Other	Row totals
Business simulation	0	20	0	0	0	0	20 74.1%
Simulation exercises	1	5	0	0	0	1	7 25.9%
Column totals	1 3.7%	25 92.6%	0	0	0	1 3.7%	27 100%

Figure 4: Program in Which Simulation is Used



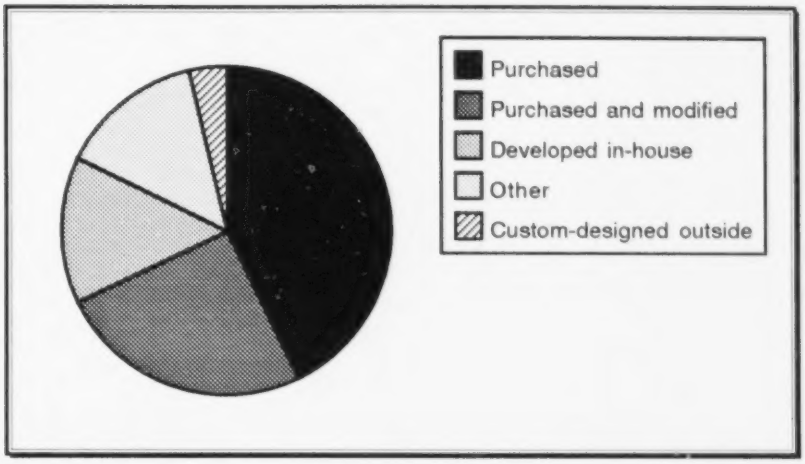
The average number of students registered in all sections of the course in which the simulation is used was 127 students (S.D. = 120). The mean of the average number of students in each class of the course in which the simulation is used was 31 students (S.D. = 23).

The most common means by which the business simulation was acquired was through an off-the-shelf purchase (12 users, 42.9%). An additional 7 users (25.0%) purchased the simulation off-the-shelf and modified it (Question 5.5b, Appendix A; Table 5; Figure 5).

Table 5: How Simulation Acquired

	Count	%
Purchased	12	42.9
Purchased and modified	7	25.0
Developed in-house	4	14.3
Other	4	14.3
Custom-designed outside	1	3.6
Total	28	100%

Figure 5: How Simulation Acquired



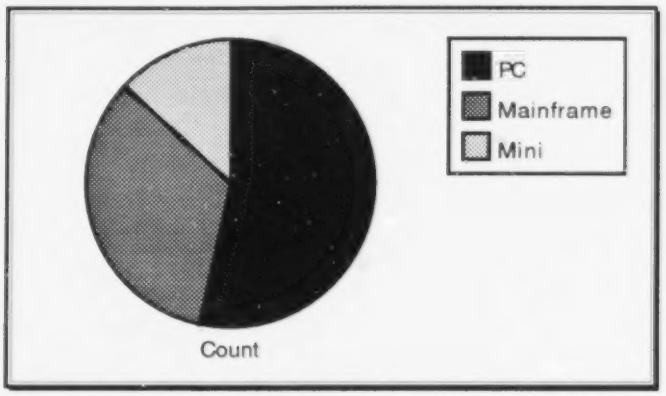
Fifteen users (53.6%) indicated that the simulation used is computer-scored. However, there may have been some confusion over what is meant by "computer-scored". For example, the user of the simulation Airline indicated that it is not computer-scored when indeed a computer is used to generate feedback for the students. Two of the users of Business Management Laboratory indicated that the simulation is not computer-scored, while the third user indicated that it is. Note that one of the instructors who participated in the pilot test of the survey expressed concern over the use of the term "computer-scored" (Question 5.5d, Appendix A).

The majority of the users whose simulations are computer-scored, used a PC for scoring (8 users, 53.3%) (Question 5.6, Appendix A; Table 6; Figure 6).

Table 6: Computer Hardware

	Count	%
PC	8	53.3
Mainframe	5	33.3
Mini	2	13.3
Total	15	100%

Figure 6: Computer Hardware

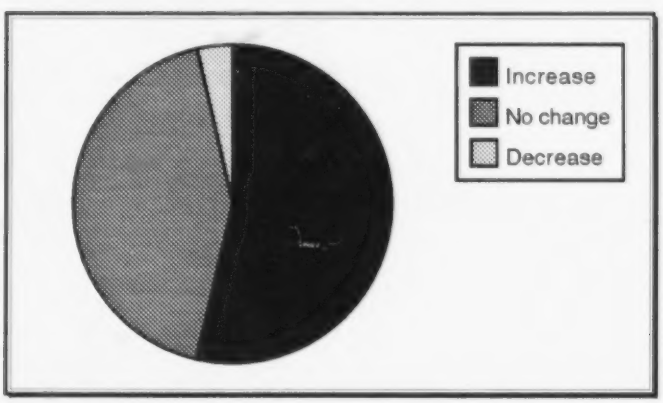


The majority of users had increased their usage level of business simulations in the past five years (15 users, 53.6%) (Question 5.7, Appendix A; Table 7; Figure 7).

Table 7: Past Usage (Users)

	Count	%
Increase	15	53.6
No change	12	42.9
Decrease	1	3.6
Total	28	100%

Figure 7: Past Usage (Users)



The majority of users also anticipated their usage level of business simulations would increase in the next five years (18 users, 66.7%) (Question 5.8, Appendix A; Table 8; Figure 8).

Table 8: Future Usage (Users)

	Count	%
Increase	18	66.7
No change	7	25.9
Decrease	2	7.4
Total	27	100%

Figure 8: Future Usage (Users)

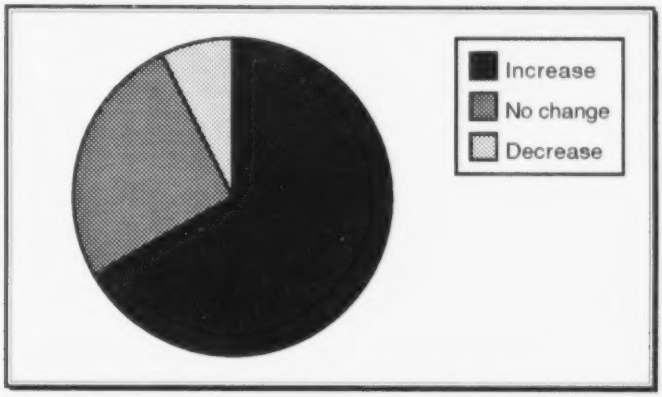
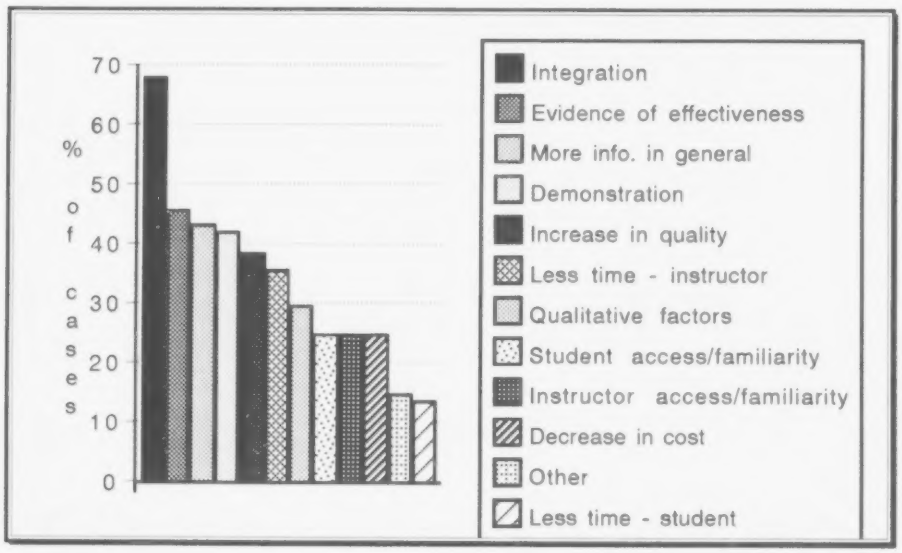


Table 9 shows that the most frequently cited reason that would motivate a non-user (including previous users) to adopt or readopt a business simulation as an instructional method was "integration with the assigned textbook" (67.9% of cases). Other reasons cited in over 40% of the cases included "evidence of teaching effectiveness", "more information about business simulations in general", and "the opportunity to see the simulation process demonstrated" (see also Question 4.3, Appendix A and Figure 9).

Table 9: Reasons to Adopt/readopt a Business Simulation

	Count	%	
		of responses	of cases (81)
Integration	55	15.9	67.9
Evidence of effectiveness	37	10.7	45.7
More info. in general	35	10.1	43.2
Demonstration	34	9.9	42.0
Increase in quality	31	9.0	38.3
Less time - instructor	29	8.4	35.8
Qualitative factors	24	7.0	29.6
Student access/familiarity	20	5.8	24.7
Instructor access/familiarity	20	5.8	24.7
Decrease in cost	20	5.8	24.7
Other	12	3.5	14.8
Less time - student	11	3.2	13.6
Total	345	100%	425.9%

Figure 9: Reasons to Adopt/readopt a Business Simulation

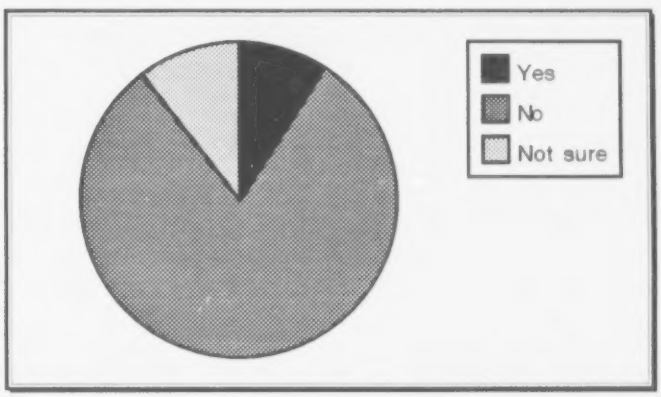


Only eight of the non-users (9.3%) planned to implement a business simulation in the 1994/95 school year (Question 4.4, Appendix A; Table 10; Figure 10).

Table 10: Plans to Implement (Non-users)

	Count	%
Yes	8	9.3
No	69	80.2
Not sure	9	10.5
Total	86	100%

Figure 10: Plans to Implement (Non-users)

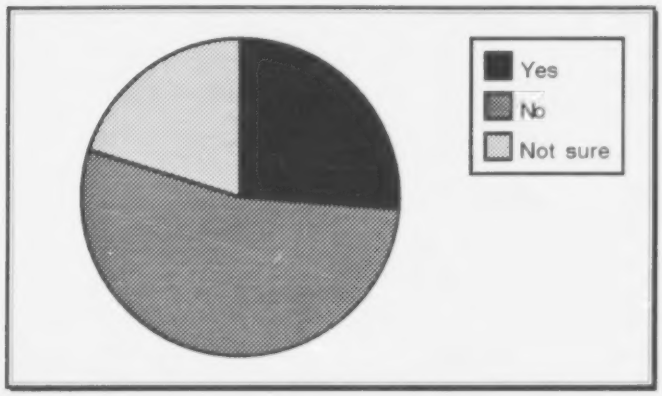


Twenty-two non-users (26.2%) planned to investigate the use of a business simulation in the 1994/95 school year (Question 4.5, Appendix A; Table 11; Figure 11).

Table 11: Plans to Investigate (Non-users)

	Count	%
Yes	22	26.2
No	45	53.6
Not sure	17	20.2
Total	84	100%

Figure 11: Plans to Investigate (Non-users)



Nature of Usage

The mean percentage of class time devoted to the business simulation was 41.8% (S.D. = 27.5, 26 valid cases). This figure is skewed because three responses were 100%. In one case, the simulation was used in an independent seminar, therefore the response is legitimate. In the two other cases, it appears that the simulation was used as a seminar within a class. Therefore, the total class time devoted to the simulation would be less that 100%. If these two cases are removed from the calculation, the mean is 36.9% (24 cases) (Question 6.1a, Appendix A).

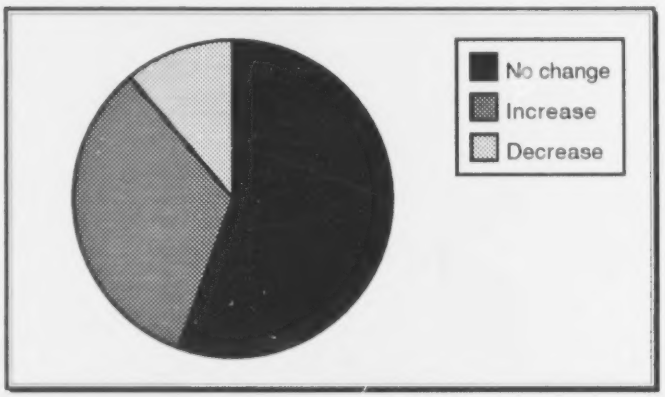
The mean percentage of class time of a yearly full load of courses represented by the independent simulation seminar was 22.7% (S.D. = 18.6, 3 valid cases). This figure is also skewed by the two cases mentioned above. The percentages that were reported as class time of a yearly full load of courses represented by the seminar in these two cases, appear to be the percentage of the course's class time devoted to the simulation. If these two cases are removed from the calculation, the mean is 3.0% (1 case). An independent seminar that ran separately from any other class, was not a common format for the delivery of business simulations (Question 6.1b, Appendix A).

The majority of users reported no change in the percentage of class time devoted to the simulation over the last five years (15 users, 55.6%) (Question 6.1c, Appendix A; Table 12; Figure 12).

Table 12: Change in Percentage of Class Time

	Count	%
No change	15	55.6
Increase	9	33.3
Decrease	3	11.1
Total	27	100%

Figure 12: Change in Percentage of Class Time

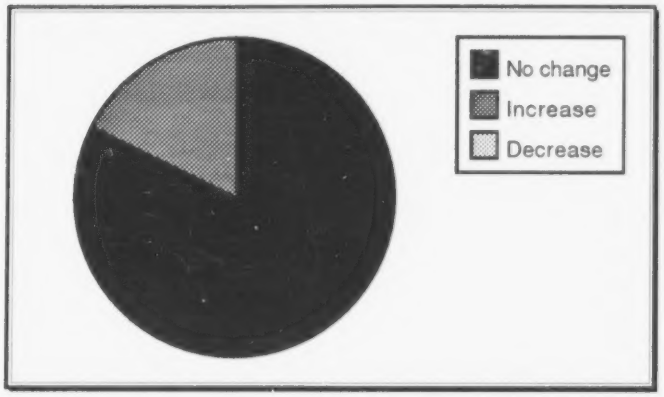


The mean percentage of course grade weighting assigned to simulation activities was 34.9% (S.D. = 20.9, 28 valid cases) (Question 6.2a, Appendix A). The majority of users reported no change to this percentage over the last five years (23 users, 82.1%) (Question 6.2b, Appendix A; Table 13; Figure 13).

Table 13: Change in Percentage of Course Weight

	Count	%
No change	23	82.1
Increase	5	17.9
Decrease	0	0
Total	28	100%

Figure 13: Change in Percentage of Course Weight

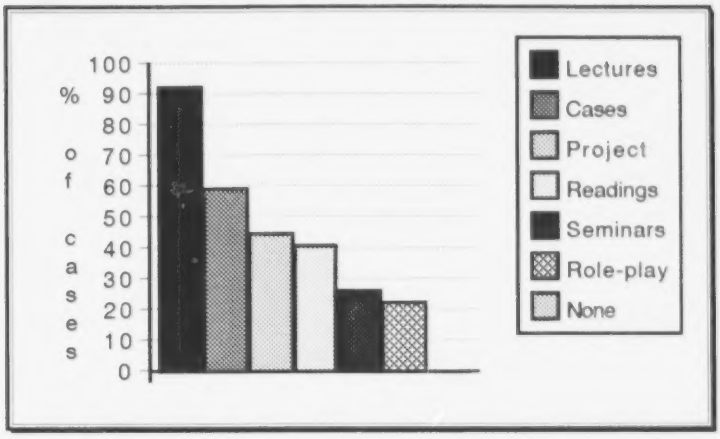


Lecture was the most common teaching method used in conjunction with simulation (25 users, 92.6% of cases). Cases, projects, and readings were also popular choices, each being used in over 40% of the cases. No one used simulation as the sole teaching method within the course (Question 6.3, Appendix A; Table 14; Figure 14).

Table 14: Other Teaching Methods

	Count	%	
		of Responses	of Cases (27)
Lectures	25	32.5	92.6
Cases	16	20.8	59.3
Project	12	15.6	44.4
Readings	11	14.3	40.7
Seminars	7	9.1	25.9
Role-play	6	7.8	22.2
None	0	0	0
Total	77	100%	285.2%

Figure 14: Other Teaching Methods

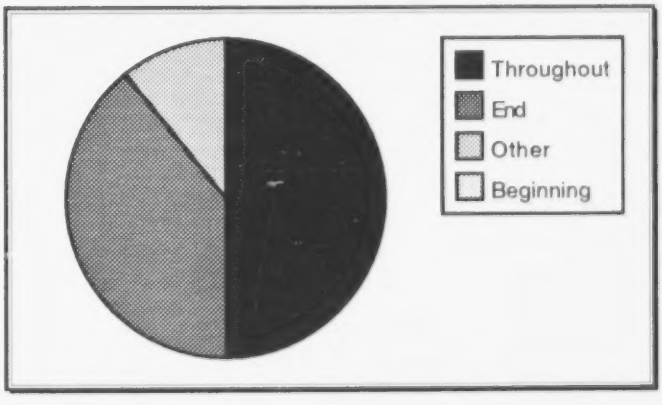


One half of users used a business simulation throughout the course. None used a business simulation at the beginning of the course as an introduction to content (Question 6.4, Appendix A; Table 15; Figure 15).

Table 15: When Used

	Count	%
Throughout	14	50.0
End	11	39.3
Other	3	10.7
Beginning	0	0
Total	28	100%

Figure 15: When Used



The mean minimum number of players was 2 (S.D. = 1, 27 valid cases). The mean maximum number of players was 4 (S.D. = 2, 27 valid cases). The mean number of rounds of play was 9 (S.D. = 6, 25 valid cases). Two of the users indicated that rounds of play were not applicable to the simulation they used, suggesting that Carson's definition might be too confining for their product (Questions 6.5a, 6.5b, and 6.6, Appendix A).

An independent t-test of the group means of rounds of play indicated a difference between users of business simulations and users of simulation exercises ($t(22) = 3.45$; $p<.05$, two-tailed). Business simulations involved more rounds of play (mean = 11, S.D. = 6) than simulation exercises (mean = 3, S.D. = 2).

The mean interval between rounds of play was 1.2 weeks (S.D. = 1.7, 22 valid cases). One user reported a wide range of intervals between rounds, from one round per week to eight rounds in one day. These data were not used in calculating the mean. In other instances where a limited range was reported, an average value was used in the calculation (Question 6.7, Appendix A).

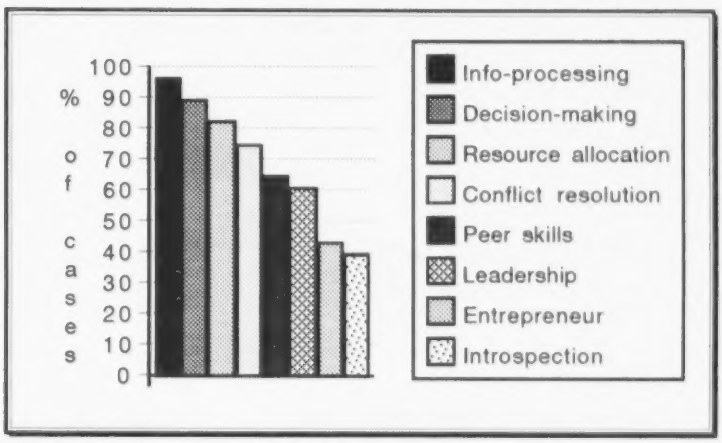
The mean number of decisions per round was 14 (S.D. = 15, 22 valid cases). Note that four users indicated that decisions per round were not applicable to their simulation, again suggesting the limitation of Carson's definition. A wide range of decisions per round were reported by different users of the same simulation product, suggesting either varying approaches to the implementation of the simulation, or various interpretations of what constitutes a decision. The range of decisions per round for FinGame was 9 to 22, and for Business Management Laboratory was 1 to 60 (Question 6.8, Appendix A).

Information-processing skills was the most common basic set of management skills which users felt were developed though the use of the simulation (27 users, 96.4% of cases). At least 39% of users felt that each of Mintzberg's (1980) eight basic skill sets were developed by simulations (Question 6.9, Appendix A; Table 16; Figure 16).

Table 16: Management Skills Taught

	Count	%	
		of Responses	of Cases (28)
Info-processing	27	17.5	96.4
Decision-making	25	16.2	89.3
Resource allocation	23	14.9	82.1
Conflict resolution	21	13.6	75.0
Peer skills	18	11.7	64.3
Leadership	17	11.0	60.7
Entrepreneur	12	7.8	42.9
Introspection	11	7.1	39.3
Total	154	100%	550.0%

Figure 16: Management Skills Taught



Perceived Advantages

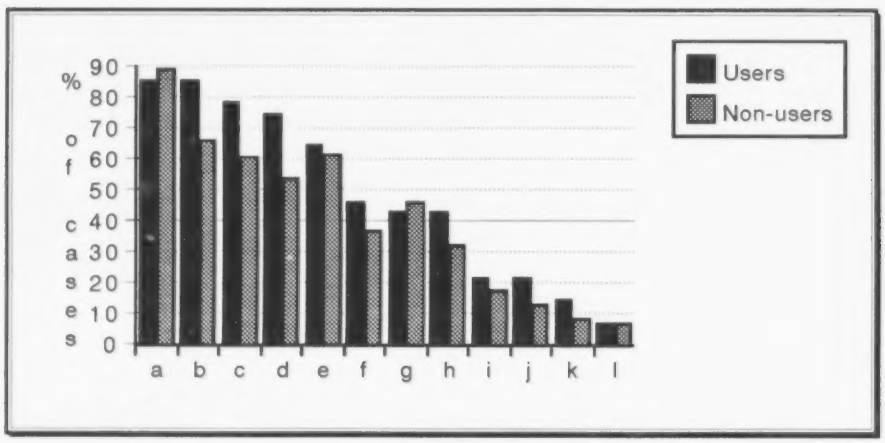
Users perceived the teaching of critical thinking skills and student enjoyment as the two greatest advantages of business simulations as a teaching method (24 users each, 85.7% of cases each). Three other advantages identified by at least one half of users include a safe environment for experimentation, the provision of better transfer of learning, and the encouragement of socialization and collaboration. Non-users also perceived the teaching of critical thinking skills and student enjoyment as the two greatest advantage of business simulations. Note, however, that the percentage of non-users who felt student enjoyment was an advantage is substantially lower than for users (66.3%). The same three additional advantages were

identified by at least one half of non-users as for users, although a smaller percentage in each instance. A greater percentage of non-users than users perceived the promotion of incidental learning about computers and application software as an advantage (Question 1.2, Appendix A; Table 17; Figure 17).

Table 17: Perceived Advantages

		Users (28 cases)		Non-users (86 cases)	
		Count	% of Cases	Count	% of Cases
a	Critical thinking	24	85.7	77	89.5
b	Enjoyable	24	85.7	57	66.3
c	Safe	22	78.6	52	60.5
d	Better transfer	21	75.0	46	53.5
e	Socialize	18	64.3	53	61.6
f	Realistic	13	46.4	32	37.2
g	Computer learning	12	42.9	40	46.5
h	Inexpensive	12	42.9	28	32.6
i	Max. use of time	6	21.4	15	17.4
j	Less threat	6	21.4	11	12.8
k	Other	4	14.3	7	8.1
l	Low dev. costs	2	7.1	6	7.0
	Total	164	585.7%	424	493%

Figure 17: Perceived Advantages



Perceived Disadvantages

Fifty percent or more of users perceived both of the following as disadvantages of business simulations as a teaching method: lack of a realistic system of rewards and punishments and available simulations do not reflect Alberta's economic reality. Over 40% perceived student computer-related problems (access, familiarity) and the lack of realization by students that there are substantial differences between the simulation and the real world, as disadvantages.

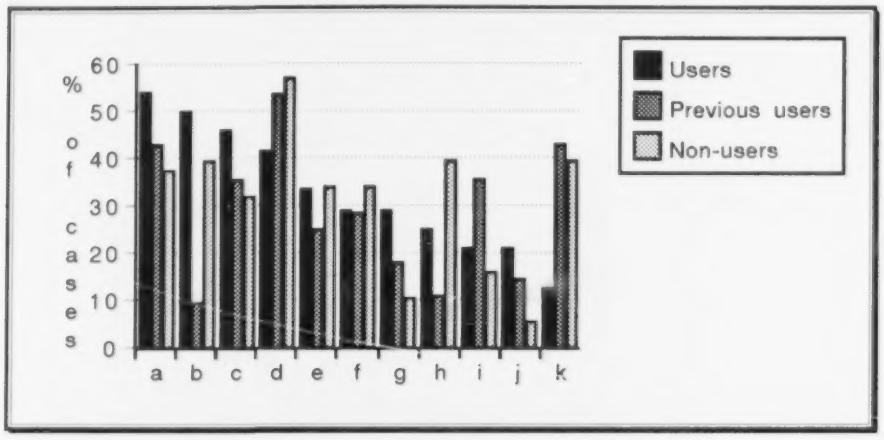
Over 50% of previous users chose the lack of reward and punishments and the lack of student realization of differences as disadvantages. Over 40% chose requiring too many resources and taking up too much time as disadvantages.

Over 50% of non-users (excluding previous users) perceived the lack of student realization of differences as a disadvantage. Not reflecting Alberta reality, requiring too many resources, and taking up more time than their learning objectives justify, were each chosen as perceived disadvantages by 39.3% of non-users (Question 2.1, Appendix A; Table 18; Figure 18).

Table 18: Perceived Disadvantages

		Users (24 cases)		Previous Users (28 cases)		Non-users (56 cases)	
		Count	%	Count	%	Count	%
a	No reward/punish	13	54.2	15	53.6	21	37.5
b	Not Alberta reality	12	50.0	10	35.7	22	39.3
c	Student problems	11	45.8	10	35.7	18	32.1
d	Don't realize difference	10	41.7	15	53.6	32	57.1
e	Demands on administrator	8	33.3	7	25.0	19	33.9
f	No curricular fit	7	29.2	8	28.6	19	33.9
g	Competition	7	29.2	5	17.9	6	10.7
h	Too many resources	6	25.0	12	42.9	22	39.3
i	Instructor problems	5	20.8	10	35.7	9	16.1
j	Other	5	20.8	4	14.3	3	5.4
k	More time than justified	3	12.5	12	42.9	22	39.3
	Total	87	362.5%	108	385.7%	193	344.6%

Figure 18: Perceived Disadvantages



Two major themes emerged from the previous users' comments on the main reason they discontinued using a business simulation: changes in the course (a change in the courses taught by the instructor, a change to the overall curriculum, or a change in course objectives) (53.6% of previous users); and a lack of resources (time, computers, money, or physical resources) (21.4%).

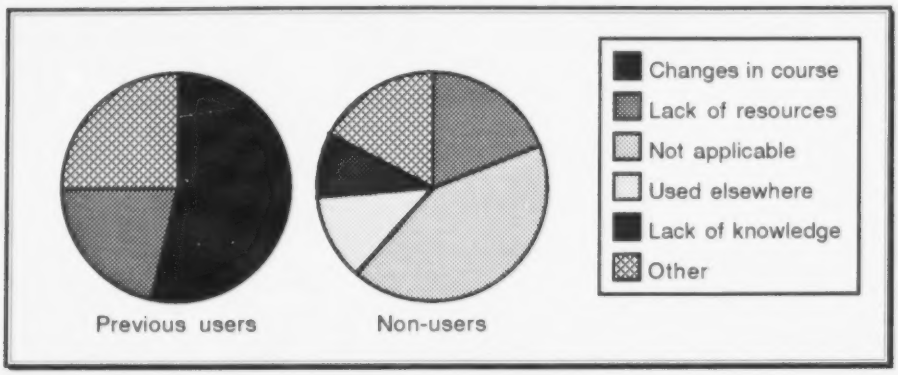
Four major themes emerged from the non-users comments on the main reason they have never used a business simulation: simulations are not applicable (47.4% of non-users), they require too many resources (19.3%), they are used elsewhere (12.3%), and the instructor lacks the required knowledge (8.8%) (Question 4.2 Appendix A; Table 19; Figure 19).

Table 19: Reasons for Discontinuing Usage/Never Using

Reasons for Discontinuing Usage (Previous Users)				
Major theme	Sub themes	Count		%
Changes in course	Instructor changed courses taught	11	15	53.6%
	Change to overall curriculum, resulting in elimination of simulation	3		
	Change in course objectives	1		
Lack of resources	Time	3	6	21.4%
	Computers	2		
	Time, money, and physical resources	1		
Other	Lack of curricular fit	2	7	25%
	Students were frustrated	1		
	Instructor not familiar with setting up simulation	1		
	Lack of Canadian content	1		
	Unrealistic decisions rewarded	1		
	Simulation went out of print	1		
Totals		28		100%

Reasons for Never Using (Non-users)				
Major theme	Sub theme	Count		%
Simulation is not applicable	Lack of curricular fit	13	24	47.4%
	Lack of suitable software	10		
	Not suitable to course level	1		
Requires too many resources	Computers, money, time	5	11	19.3%
	Time	5		
	Computers	1		
Used elsewhere	Used in another course	3	7	12.3%
	Not responsible for "that" course	2		
	Not in my teaching load	2		
Lack of knowledge	General unfamiliarity with simulations	3	5	8.8%
	Unfamiliar with simulation options	1		
	Lack of prior knowledge required	1		
Other	Integration problems	3	10	17.5%
	Coordination across courses/group consensus too difficult	2		
	Unrealistic	1		
	Don't see value	1		
	Limited teaching responsibilities	1		
	Group work not successful due to variance in student ability	1		
	Learning outcomes don't justify the time	1		
Totals		57		100%

Figure 19: Reasons for Discontinuing Usage/Never Using



Relative Teaching Effectiveness

Users rated cases and simulations as equally effective teaching methods, with a mean score of 7.7 of a possible 10. Lectures and readings were rated much lower by users, with mean scores of 6.2 and 5.0, respectively. Non-users rated cases as the most effective method, with a mean score of 7.5. Simulations were rated second with a mean score of 6.8, lectures third with 6.2, and readings last with a rating of 5.2.

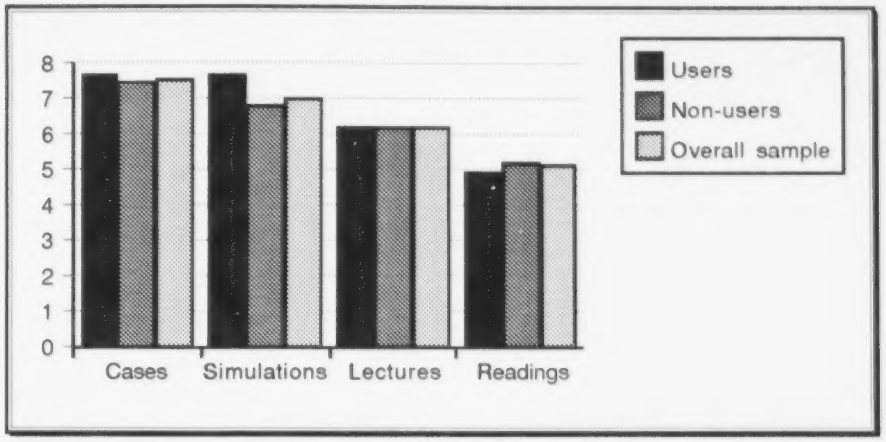
An independent t-test of the group means of perceived relative effectiveness of business simulations indicated a difference between the users and non-users ($t(108) = 2.34$; $p<.05$, two-tailed). Users rated business simulations significantly higher than non-users. There were no differences between the group means of perceived relative effectiveness of cases, lectures, and readings (Question 3.1, Appendix A; Table 20; Figure 20).

Table 20: Global Comparisons

Method	Users		Non-users		Overall sample		T-test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Cases	7.7	1.3	7.5	1.2	7.5	1.2	t(111)=.84
Simulations	7.7	1.7	6.8	1.6	7.0	1.7	t(108)=2.34*
Lectures	6.2	1.8	6.2	1.7	6.2	1.7	t(111)=.12
Readings	5.0	2.0	5.2	1.6	5.1	1.7	t(110)=-.62

*p<.05

Figure 20: Global Comparisons



Overall, the mean score of users' ratings of the simulation they use, was greater than 3 out of a possible 5, on nine out of ten characteristics. "Provides an enjoyable learning experience", "requires participants to make a balanced decision set", "is realistic" and "provides adequate information" were rated the highest, with means scores of 4.0, 4.0, 3.9, and 3.9, respectively. "Reflects Alberta's business practice" and "reflects Alberta's business environment" were rated the lowest, with means scores of 3.2 and 2.9, respectively.

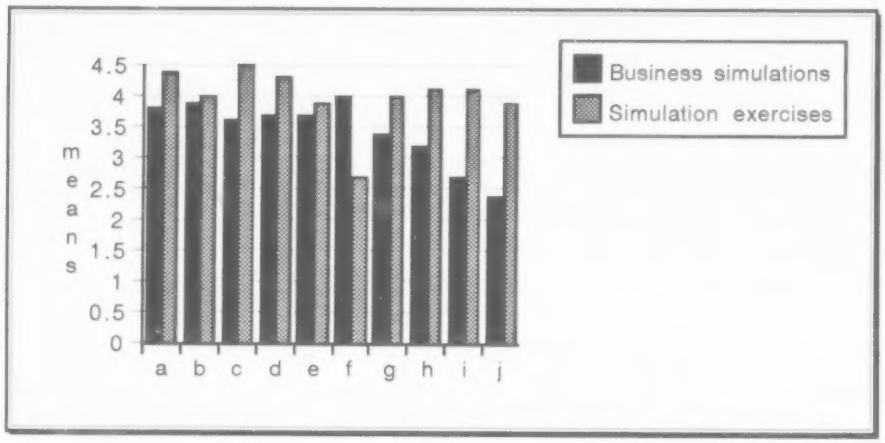
Independent t-tests of the group means of characteristic ratings indicated a difference between users of business simulations and users of simulation exercises for 5 out of the 10 characteristics. Business simulations were rated lower than simulation exercises on four characteristics: "realistic", "reflects Alberta business environment", "reflects Alberta business practice", and "provides an enjoyable learning experience". Business simulations were rated higher than simulation exercises on one characteristic: "facilitates adequate 'what if' analysis" (Question 6.10; Table 21; Figure 21).

Table 21: Evaluation of Characteristics of Simulation (Users)

		Business simulations		Simulation exercises		Overall		T-test
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
a	Enjoyable	3.8	.62	4.4	.54	4.0	0.7	t(25)=-2.4*
b	Balanced decision set	3.9	1.2	4.0	1.3	4.0	1.1	t(23)=-.19
c	Realistic	3.6	.83	4.5	.78	3.9	0.9	t(25)=-2.9*
d	Adequate info.	3.7	1.1	4.3	1.1	3.9	1.1	t(25)=-1.1
e	Complex	3.7	.93	3.9	1.1	3.7	0.9	t(25)=-.49
f	"What if" analysis	4.0	1.1	2.7	.82	3.7	1.1	t(24)=2.7*
g	High course rating	3.4	.68	4.0	1,2	3.6	0.8	t(25)=-1.7
h	Heavy work load	3.2	1.2	4.1	1.1	3.5	1.3	t(25)=-1.8
i	Reflect practice	2.7	.93	4.1	.55	3.2	1.3	t(24)=-2.9*
j	Reflect environment	2.4	1.1	3.9	1.7	2.9	1.5	t(24)=-2.5*

* p<.05

Figure 21: Evaluation of Characteristics of Simulation



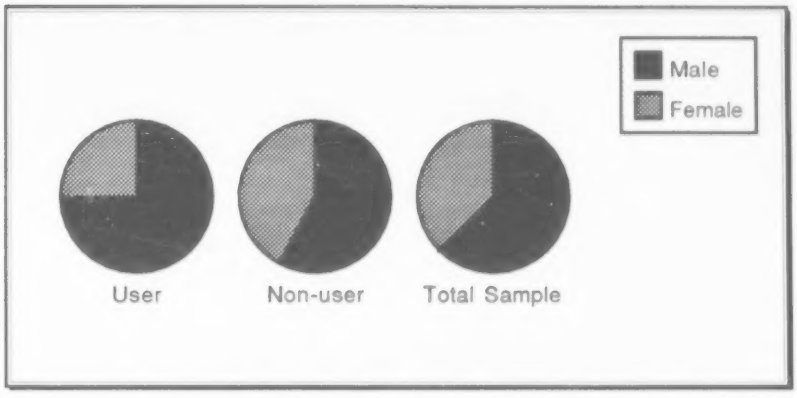
Profile of User vs. Non-user

The majority of respondents were male (61.9%); 75.0% of users were male and 57.6% of non-users were male. A chi-square test determined that there is no interaction between business simulation use and gender ($X^2(1) = 2.7$; $p>.05$) (Question 7.1, Appendix A; Table 22; Figure 22).

Table 22: Gender

	Male	Female	Row total
User	21	7	28 24.8%
Non-user	49	36	85 75.2%
Column total	70 61.9%	43 38.1%	113 100.0%

Figure 22: Gender

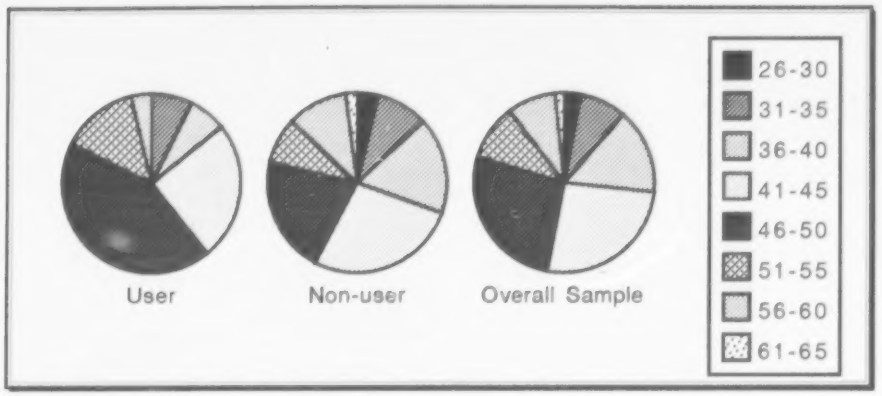


The largest group of users fell into the age category of 46-50 (43.9%). The largest group of non-users fell into the age category of 41-45 (27.1%). However, a chi-square test determined that there is no interaction between business simulation use and age. ($X^2(7) = 9.0$; $p>.05$) (Question 7.2, Appendix A; Table 23; Figure 23).

Table 23: Age

	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	Row totals
User	0	2	2	7	12	4	1	0	28 24.8%
Non-user	3	8	15	23	18	7	9	2	85 76.2%
Column totals	3 2.7%	10 8.8%	17 15.0%	30 26.5%	30 26.5%	11 9.7%	10 8.8%	2 1.8%	113 100.0%

Figure 23: Age



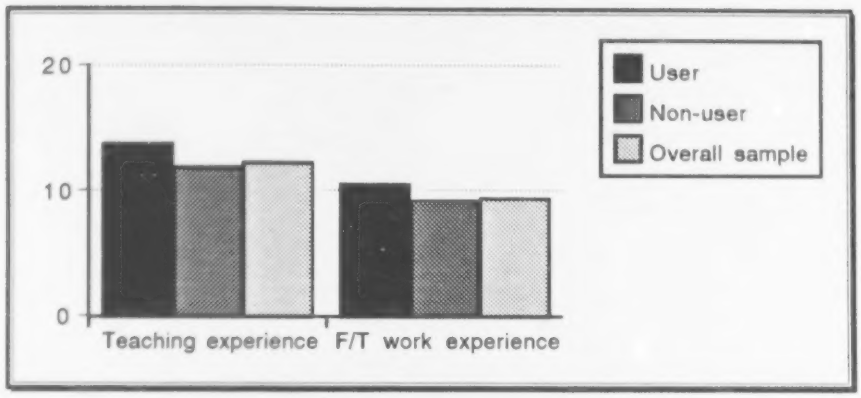
Users had an average of 13.8 years of teaching experience and 10.5 years of full-time work experience, outside of teaching. Non-users had an average of 12.4 years of teaching experience and 9.5 years of full-time work experience.

An independent t-test of the group means of teaching experience indicated no difference between the users and non-users ($t(111) = 1.23$; $p>.05$, two-tailed). An independent t-test of the group means of full-time work experience indicated no difference between the users and non-users ($t(111) = .96$; $p>.05$, two-tailed) (Questions 7.4 & 7.5, Appendix A; Table 24; Figure 24).

Table 24: Experience

	User		Non-user		Overall sample		T test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Teaching experience	13.8	7.1	11.9	7.3	12.4	7.3	t(111)=1.23
F/T work experience	10.5	6.6	9.2	6.5	9.5	6.5	t(111)=.96

Figure 24: Experience



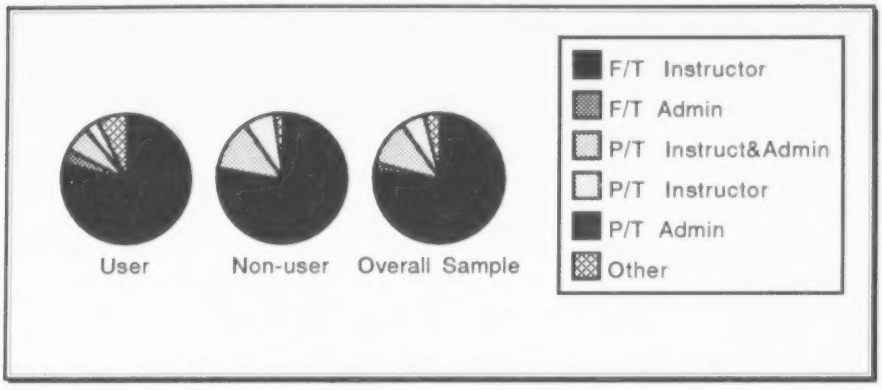
The majority of respondents (77.0%) were full-time instructors; 78.6% of users were full-time instructors and 76.5% of non-users were full-time instructors (Question 7.5, Appendix A; Table 25; Figure 25).

A chi-square test determined that there is no interaction between business simulation use and the educational role of the respondent ($X^2(4) = 3.1$; $p>.05$).

Table 25: Educational Role

	F/T instructor	F/T admin	P/T instruct & admin	P/T instructor	P/T admin	Other	Row totals
User	22	1	2	1	0	2	28 24.8%
Non-user	65	1	11	6	0	2	85 75.2%
Column totals	87 77.0%	2 1.8%	13 11.5%	7 6.2%	0 0%	4 3.5%	113 100.0%

Figure 25: Educational Role

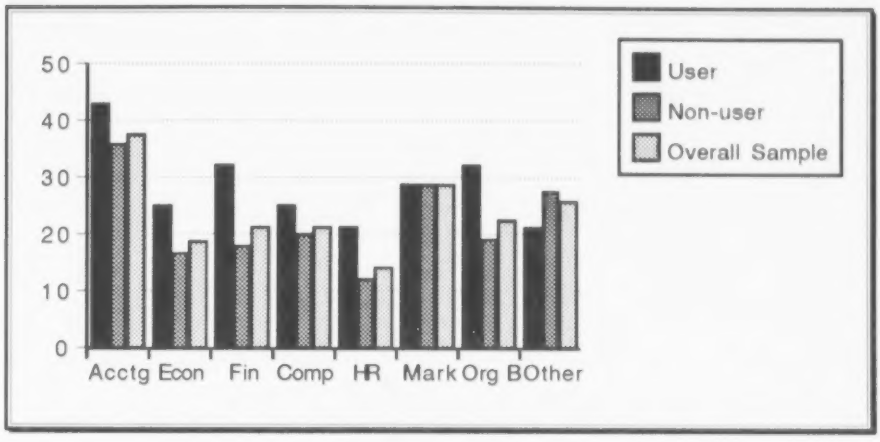


Twelve users (42.9%) reported accounting as an area of specialization. Finance and organizational behavior were also popular specializations, each reported by 32.1% of users. Non-users also reported accounting most frequently as a specialization (35.7%). Marketing and "other" specializations were also popular, reported by 28.6% and 27.4% of non-users, respectively. "Other" specializations included statistics, math, or quantitative methods (10 respondents), communications (7 respondents), law, appraisal, taxation, international business, and general computers (1 respondent each) (Question 7.6, Appendix A; Table 26; Figure 26).

Table 26: Specialization

	User (28 cases)		Non-user (84 cases)		Overall sample (112 cases)	
	Count	% cases	Count	% cases	Count	% cases
Accounting	12	42.9	30	35.7	42	37.5
Finance	9	32.1	15	17.9	24	21.4
Org. behavior	9	32.1	16	19.0	25	22.3
Marketing	8	28.6	24	28.6	32	28.6
Economics	7	25.0	14	16.7	21	18.8
Computing	7	25.0	17	20.2	24	21.4
Human resources	6	21.4	10	11.9	16	14.3
Other	6	21.4	23	27.4	29	25.9
Total	64	228.6%	149	177.4%	213	190.2%

Figure 26: Specialization



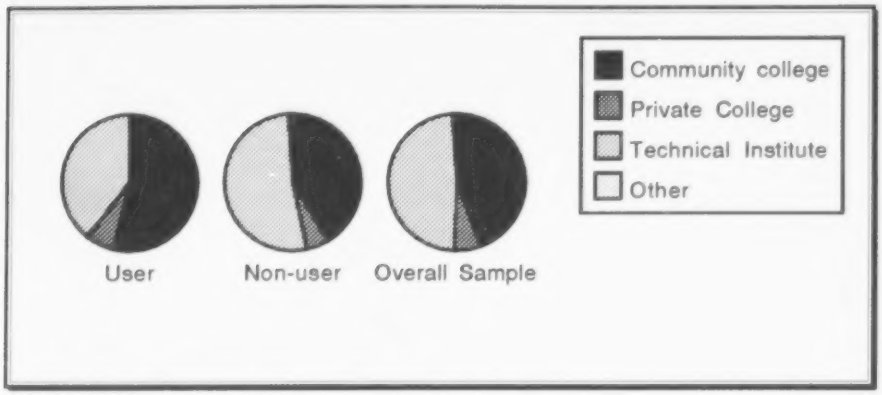
The majority of users teach at community colleges (53.6%) or technical institutes (39.3%). This is also the case among non-users: 41.2% teach at community colleges and 51.8% teach at technical institutes (Question 7.7, Appendix A; Table 27; Figure 27). Note that the population of business administration instructors may be broken down by educational institution as follows: 48.4% at technical institutes, 44.3% at community colleges, 4.8% at private colleges, and 2.6% at other institutions.

A chi-square test determined that there is no interaction between business simulation use and the type of educational institution at which an instructor works ($X^2(3) = 1.8$; $p>.05$).

Table 27: Type of Post-secondary Institution

	Community college	Private college	Technical institute	Other	Row totals
User	15	2	11	0	28 24.8%
Non-user	35	5	44	1	85 75.2%
Column totals	50 44.2%	7 6.2%	55 48.7%	1 .9%	113 100.0%

Figure 27: Type of Post-secondary Institution



The mean rating for users' familiarity with business simulations was 3.9 of a possible 5. The mean rating for users' familiarity with computers was 4.0 of a possible 5. The corresponding figures for non-users were 2.8 and 3.6.

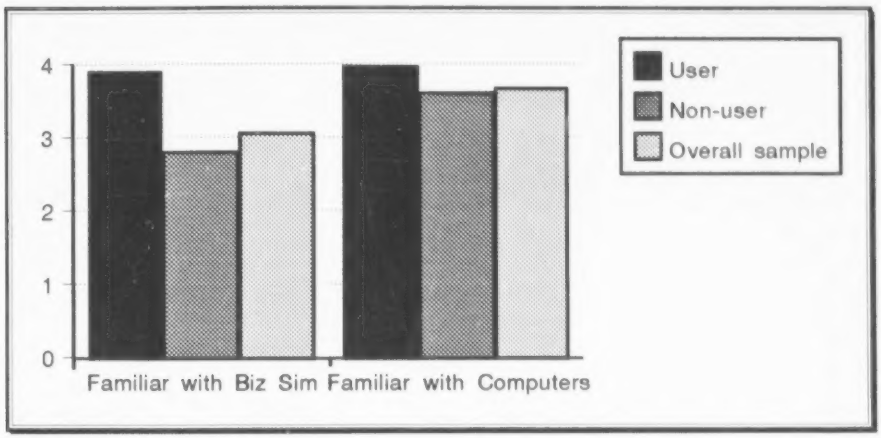
An independent t-test of the group means of familiarity with business simulations indicated a difference between the users and non-users ($t(113) = 4.5$; $p<.05$, two-tailed). Users rated themselves significantly higher than non-users on familiarity with business simulations. An independent t-test of the group means of familiarity with computers indicated no difference between the users and non-users ($t(111) = 1.50$; $p>.05$, two-tailed) (Questions 1.1 & 7.8; Table 28; Figure 28).

Table 28: Familiarity with Business Simulations/Computers

	User		Non-user		Overall sample		T-test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Familiarity with business simulations	3.9	1.1	2.8	1.1	31	1.2	t(113)=4.5*
Familiarity with computers	4.0	1.0	3.6	1.1	3.7	1.1	t(111)=1.5

*p<.05

Figure 28: Familiarity with Business Simulations/Computers



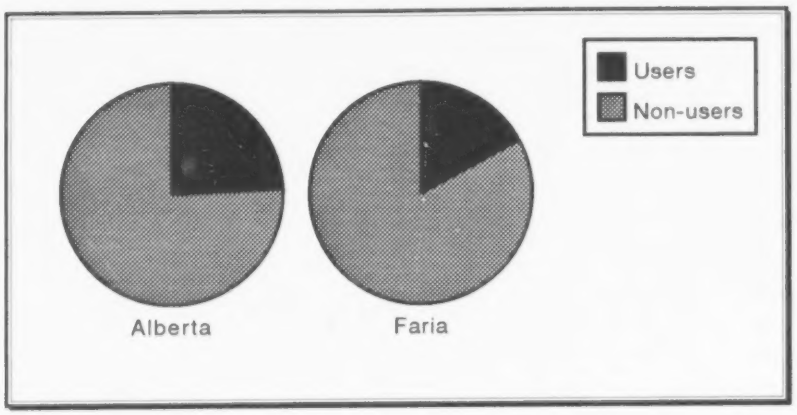
Alberta Study vs. Faria Study

Twenty-eight respondents (24.3%) were users in the Alberta study compared to 17.3% in Faria's study (Table 29, Figure 29). Note that if only the simulation users whose product appear to meet Carson's definition of business simulation are considered, then only 17.4% of respondents in the Alberta study were users.

Table 29: Current Usage

	Alberta		Faria	
	Count	%	Count	%
Users	28	24.3	47	17.3
Non-users	87	75.7	224	82.7
Total	115	100%	271	100%

Figure 29: Current Usage

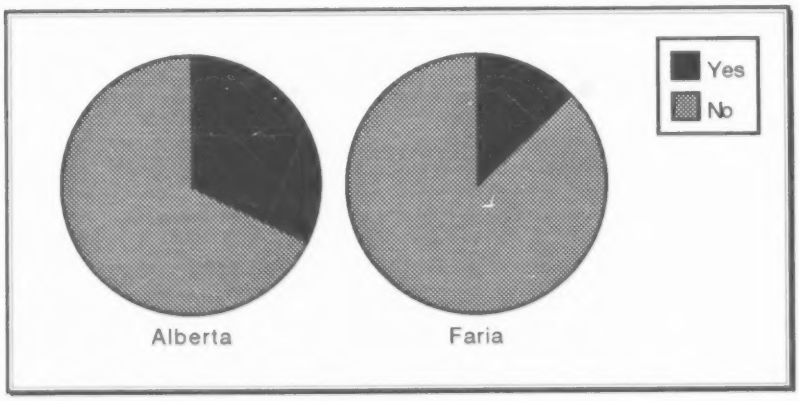


Twenty-eight non-users (32.2%) had used a business simulation previously in the Alberta study, compared to 12.9% in Faria's study (Table 30, Figure 30).

Table 30: Previous Usage (Non-users)

	Alberta		Faria	
	Count	%	Count	%
Yes	28	32.2	29	12.9
No	59	67.8	195	87.1
Total	87	100%	224	100%

Figure 30: Previous Usage (Non-users)

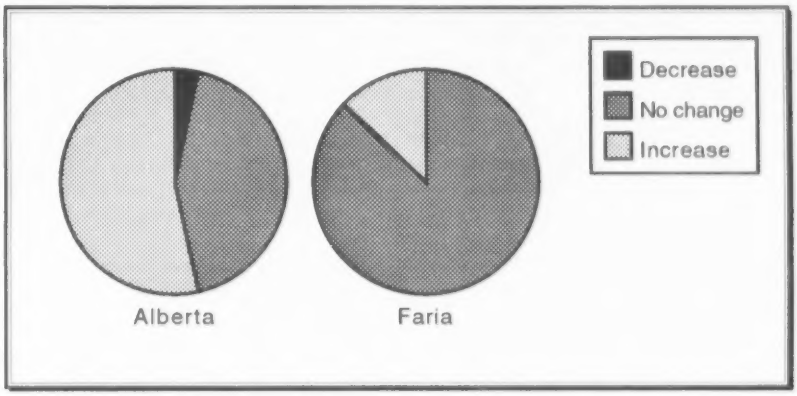


In the Alberta study, the majority of users (53.6%) had increased their usage of business simulations in the last five years. In Faria's study, the majority of users (89.4%) had seen no change in usage (Table 31, Figure 31).

Table 31: Past Usage (Users)

	Alberta		Faria	
	Count	%	Count	%
Decrease	1	3.6	0	0
No change	12	42.9	41	89.4
Increase	15	53.6	6	10.6
Total	28	100%	47	100%

Figure 31: Past Usage (Users)

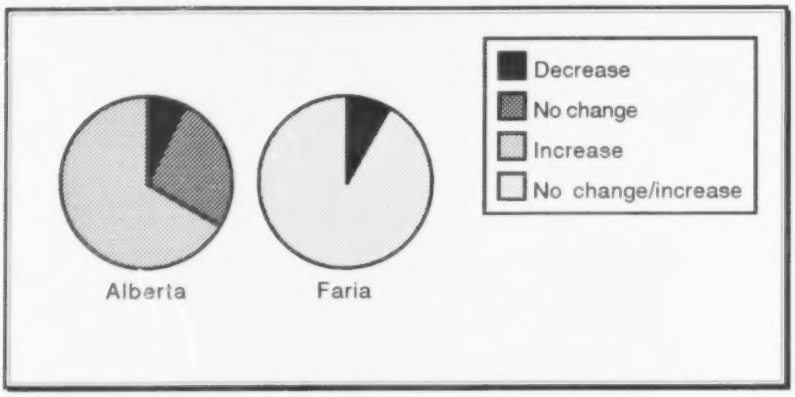


In the Alberta study, 92.6% of users anticipated no change or an increase in their usage of business simulations in the next five years. In Faria's study, 91.5% anticipated no change or an increase in usage (Table 32, Figure 32).

Table 32: Future Usage (Users)

	Alberta		Faria	
	Count	%	Count	%
Decrease	2	7.4	4	8.5
No change	7	25.9	43	91.5
Increase	18	66.7		
Total	27	100%	47	100%

Figure 32: Future Usage (Users)



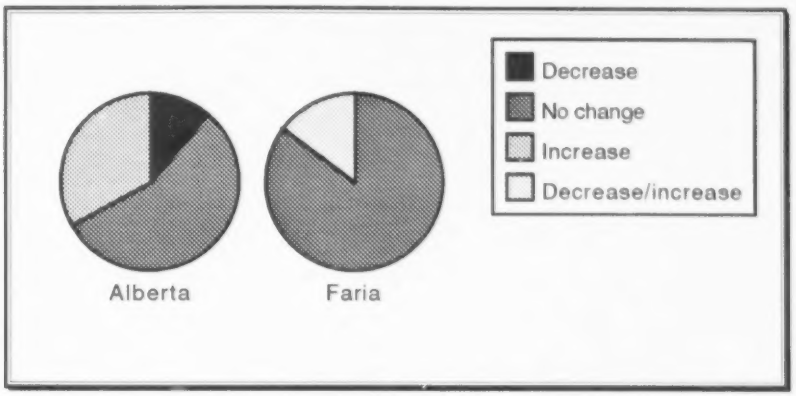
The percentage of class time devoted to business simulation in the Alberta study ranged from 10% to 100%, with an average of 42%. The percentage of class time devoted to business simulation in Faria's study ranged from 5% to 100%, with an average of 29%.

In the Alberta study, 55.6% of users reported no change, over the last five years, in the percentage of class time devoted to simulations activities. In Faria's study, 85.1% reported no change (Table 33, Figure 33).

Table 33: Change in % of Class Time over Past

	Alberta		Faria	
	Count	%	Count	%
Decrease	3	11.1	?	?
No change	15	55.6	40	85.1
Increase	9	33.3	?	?
Total	27	100%	47	100%

Figure 33: Change in % of Class Time over Past



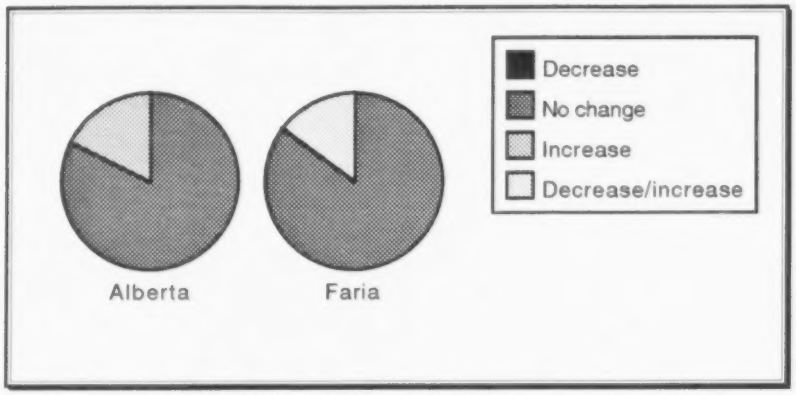
The course grade weighting assigned to the simulation activities in the Alberta study ranged from 10% to 100% with an average of 35%. The course grade weighting assigned to the simulation activities in Faria's study ranged from 5% to 100% with an average of 24%.

In the Alberta study, 82.1% of users reported no change in the percentage of the course grade weighting assigned to the simulations activities over the last five years. In Faria's study, 85.1% reported no change (Table 34, Figure 34).

Table 34: Change in % of Course Grade over Past

	Alberta		Faria	
	Count	%	Count	%
Decrease	0	0	?	?
No change	23	82.1	40	85.1
Increase	5	17.9	?	?
Total	28	100%	47	100%

Figure 34: Change in % of Course Grade over Past

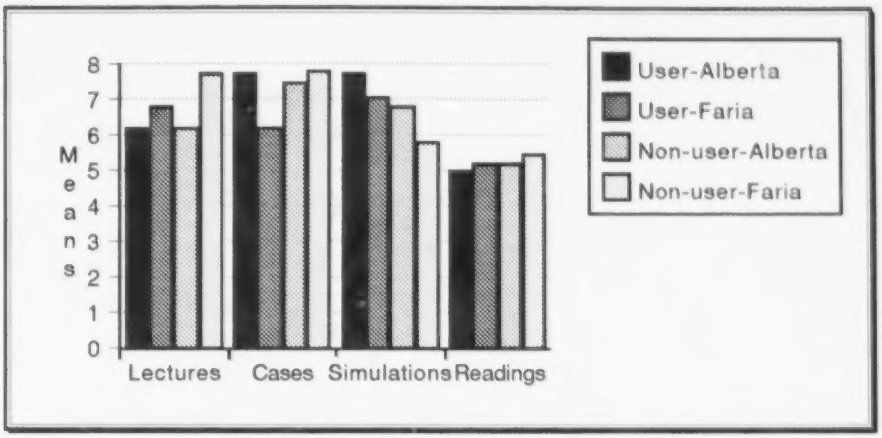


In the Alberta study, business simulations were in a tie position for first place with cases with respect to teaching effectiveness among users, they were in second place overall, as well as a poor second behind cases among non-users. In the Faria study, business simulations were rated the highest by users, they were in third place overall, as well as a poor third behind lectures and cases among non-users (Table 35, Figure 35).

Table 35: Relative Teaching Effectiveness

	User		Non-user		Overall sample	
	Alberta	Faria	Alberta	Faria	Alberta	Faria
Lectures	6.2	6.8	6.2	7.7	6.2	7.5
Cases	7.7	6.2	7.5	7.8	7.5	7.4
Simulations	7.7	7.1	6.8	5.8	7.0	6.1
Readings	5.0	5.2	5.2	5.5	5.1	5.4

Figure 35: Relative Teaching Effectiveness

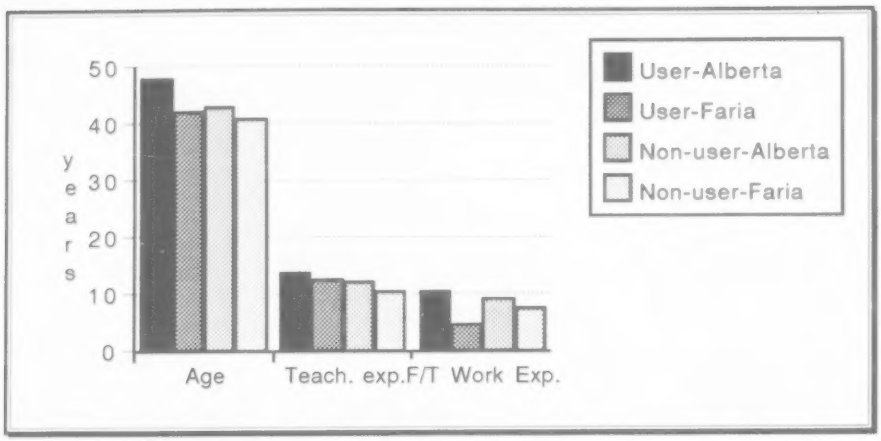


In the Alberta study, the largest age category among users was 45 to 50, while the largest category among non-users was the younger age group of 41-45. However, no interaction exists between business simulation use and age. There were also no differences between the group means of teaching experience and full-time work experience. By contrast, Faria reported that non-users, on the average, were slightly younger, had less teaching experience and more full-time work experience (Table 36, Figure 36).

Table 36: User/Non-user Profiles

	User		Non-user	
	Alberta	Faria	Alberta	Faria
Age	45-50	42.1	41-45	40.9
Teaching experience	13.8	12.7	11.9	10.4
F/T Work Experience	10.5	4.7	9.2	7.6

Figure 36: User/Non-user Profile

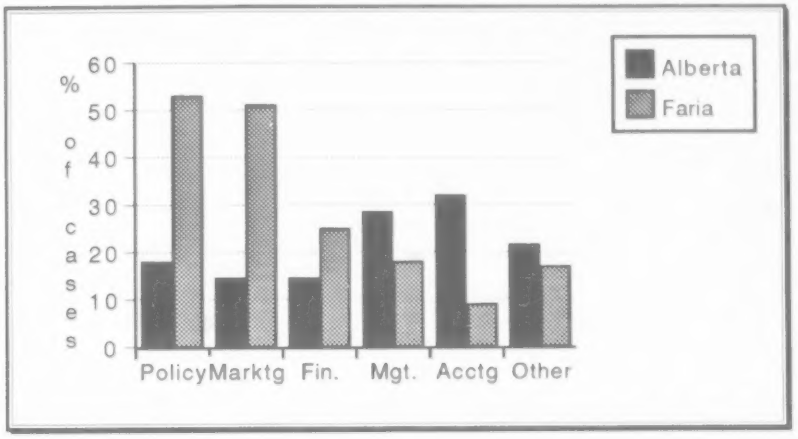


In the Alberta study, instructors reported that business simulations were used most frequently in the accounting and management disciplines. In Faria's study, business school deans reported that business simulations were used most frequently in the business policy and marketing disciplines (Table 37, Figure 37).

Table 37: Discipline in Which Simulation is Used

	Alberta (28 cases)		Faria (202 cases)	
	Count	% of cases	Count	% of cases
Business policy	5	17.9	107	52.9
Marketing	4	14.3	103	51.0
Finance	4	14.3	50	24.8
Management	8	28.6	36	17.8
Accounting	9	32.1	18	8.9
Other	6	21.4	34	16.8
Total	36	128.6%	348	172.3%

Figure 37: Discipline in Which Simulation is Used



Chapter V

Discussion of Results

Introduction

This chapter provides a discussion of the results of the study. Discussion revolves around the extent of usage of business simulations, the nature of usage, advantages, disadvantages, relative effectiveness, user/non-user profiles, and a comparison with Faria's study. Conclusions are drawn and recommendations are made regarding practical application and future research.

Extent of Usage

The current extent of usage is high relative to Faria's study. Previous usage is also high relative to Faria's results. There are three reasons for these differences. First, it is apparent that the working definition of "business simulation" is broader among instructors in community colleges and technical institutes than among university instructors. Second, it has been seven years since Faria's study, and all indications point to a growing popularity of simulations as a teaching method. Third, colleges and technical institutes tend to be more pragmatic than universities, therefore, the value of a practical exercise such as a simulation may be more apparent to a college instructor.

A major finding of the study is that within community colleges and technical institutes, the term "business simulation" has a broad meaning. Burgess (1991) refers to the confusion that results from the varying interpretations of the term. In this study, users were

identified who use traditional business simulations that generate income statements and balance sheets as performance feedback to the student manager. However, users were also identified that use simulations in which the student practices written communication skills, accounting skills, the use of decision support software, and project development skills. These non-traditional simulations are referred to here as "simulation exercises". The identification by one user of an office procedures simulation, reflects the broad definition of business education in community colleges which includes secretarial sciences.

The majority of users indicated that one of the reasons they adopted a business simulation was as a result of an evaluation of alternatives. This finding agrees with that of McKenna (1991), where 50% of users gave evaluation of alternatives as a reason for adoption. These results support the need for objective information on simulations in order for instructors to choose among alternative teaching methods.

The most common disciplines in which business simulations are used are accounting and management. This finding is in contrast to Faria's study (1987) in which he concluded that there is a need for more development of simulations in the areas of finance, accounting, and management. "Other" disciplines ranked third in the Alberta study and included human resources, information systems, labour relations, communications, and organizational behavior. These results reflect the broad use to which simulations are being put in community colleges and technical institutes.

The two-year diploma program is the most common format for simulation use. There are three reasons for this. First, the two-year format is the most common within community colleges and technical institutes for studies in business administration. Second, because of the time demands of simulations, they fit more readily into a longer program. Third, to benefit from a business simulation, a student needs a solid foundation in business concepts which is better achieved in a two-year program. The broader usage of simulation exercises across programs compared to the usage of business simulations reflects the greater flexibility of the simulation exercises.

Since on average 120 students are registered in all sections of the course in which a simulation is used, the 28 users identified in this study used simulations with approximately 3360 students.

Extending this calculation to the entire population of business administration instructors, 67 instructors exposed approximately 8040 students to simulations in the 93/94 school year. Simulations, therefore, have high penetration in business administration programs. The high variance in the numbers of students per course and per class reflects the variety of approaches to the implementation of business simulations.

Over two thirds of the simulations were purchased, of which over one third were modified for use. Burgess' findings (1991) were very similar. These findings suggest a need for publishers to be more responsive to the needs of simulation users.

Only 53.6% of users use a computer-scored business simulation. As was mentioned in Chapter 4, one reason for the low rate may be a misunderstanding of the term "computer-scored". Although most computer-scored simulations were run on a PC, the mainframe computer was used for one third of the computer-scored simulations. Given the large numbers of students involved with the simulation in any give course, a mainframe may be the most practical hardware for processing the large amount of data generated. (One instructor in the pilot testing suggested that the cost of processing one round of play was approximately $12,000 of mainframe computer time.)

Simulation usage among users has been climbing and will continue to climb. Given their increasing popularity, more research is required into how the needs of instructors and students might be better met through simulations.

The main reason that a non-user would adopt or readopt a business simulation is if it were integrated with the textbook. Therefore, there is a need for the development of simulations which complement more traditional teaching tools. Non-users also indicated that more information in general and a demonstration would motivate them to use a business simulation. There is a need for more relevant information on simulations to be made available to instructors. This conclusion is supported by the finding that although few non-users plan to implement a business simulation, over one quarter plan to investigate their use. Therefore, more relevant information on simulation as an instructional method would assist instructors in their investigation.

Nature of Usage

The percentage of class time devoted to the simulation (42%) was high relative to Faria's study (29%), as was the percentage of the course grade weighting assigned to simulation activities (35% vs. 24%). This reflects the more prominent role that simulations are assuming within business administration programs. The wide variance in the percentages in the Alberta study reflects the variety of approaches to implementation. The majority of users felt that neither the proportion of class time used nor the proportion of course grading would change, suggesting a certain level of stability in the way in which an individual instructor chooses to employ the simulation. Note that although some instructors were choosing to use simulations in a separate seminar within a course, only one instructor used a simulation independent of any course.

Although usage is relatively high, instructors do not use simulations independently of other teaching methods. On average, a simulation user employs three other teaching methods in conjunction with the simulation, the most common of which is lecture. Even in the face of innovation, lecture remains a key teaching method for business administration instructors. In keeping with non-users' desire for simulations which are integrated with the text, over 40% of users employ readings in conjunction with simulation.

Approximately 90% of users use simulations throughout the course or at the end. None use them at the beginning of the course. The reason for this are twofold: first, business simulations are time consuming, and second, business simulations build on prerequisite business skills.

The typical business simulation involves a team of two to four players, involved in nine rounds of play, with six school days in-between rounds, and 14 decisions per round. Two conclusions may be drawn from the data on organization of play. First, the survey questions were designed to gather data on traditional business simulations. Therefore, a number of users indicated that the questions on rounds of play and decisions per round were not applicable. One user commented that the questions on the organization of play "strongly implies a very specific type of simulation (which is) not applicable to the one I use which is more complex and realistic". Second, a variety of approaches to the organization of play, abounds.

The results on skills developed suggest that all basic sets of management skills are developed to some extent by business simulations. The reason business simulations are used in conjunction with other teaching methods may be to strengthen their impact on students across all management skill areas.

Perceived Advantages

To a large degree, the perceptions of users and non-users are in agreement as to the advantages of business simulations. The same top five advantages were cited by both users and non-users, with critical thinking at the top of both lists. This level of agreement may be due to a common understanding of what constitutes a business simulation, which may be influenced by the large number of non-users who are previous users.

The differences in perceptions between users and non-users are also revealing. A substantially higher margin of users attribute enjoyment as an advantage. This difference in perception may be a definite barrier to adoption by non-users. Secondly, a higher margin of non-users attribute incidental computer learner as a advantage. Non-users may not realize that a large proportion of the simulation users are not employing computers.

Perceived Disadvantages

There was some agreement as to the perceived disadvantages of business simulations, among users, previous users, and non-users. The lack of student realization of the differences between the simulation and reality was among the top four disadvantages for all three groups of respondents. The lack of reward and punishments, not reflecting Alberta's economic reality, requiring too many resources, and taking up too much time, were among the top four disadvantages for two of the three groups of respondents. Again, this may reflect a common understanding of what constitutes a business simulation.

Previous users have discontinued using business simulations largely due to circumstances rather than due to frustration or disillusionment. Typically, the nature of the course being taught has changed, making the use of a simulation no longer applicable.

However, lack of resources also influenced the discontinuation of usage in many cases. This is an issue that needs to be addressed by administrators at educational institutions. With cutbacks to post-secondary education becoming the norm, will students be deprived of innovative learning experiences?

Almost one half of non-users (excluding previous users) have never used a business simulation because they feel it is not applicable to the courses they teach. Non-users cited the following disciplines as inappropriate for the use of simulations: economics, business law, math, statistics, and oral communications. Of these, Wolfe (1985) includes economics as one of the functional areas in which business simulations are used. The following disciplines were also mentioned as inappropriate for simulations: business computing, human resources management, marketing, organizational behaviour, accounting, retail sales, business communications, financial accounting, and finance. For each of these additional "inappropriate" disciplines, there was a user who indicated they use a simulation in that area. Although, users and non-users may agree on advantages and disadvantages of business simulations, there appears to be a communication barrier regarding the wide variety of business simulations that are available.

Lack of resources is also perceived to be a significant barrier preventing non-users from employing a simulation.

Relative Teaching Effectiveness

Of the four teaching methods which users and non-users rated according to effectiveness, only the ratings of business simulations revealed a significant difference between the two groups of respondents. This is an expected result since in order to make the effort required to use a business simulation, an instructor must be convinced of its effectiveness. There is much to be said for Keefe's recommendation (1993) for a dialogue between users and non-users in order to overcome the limitations of simulations and to examine their impact on learning.

The evaluation of specific characteristics of the simulation used, resulted in an above average rating on 9 out of 10 characteristics, overall. McKenna (1991) obtained similar results: above average ratings resulted on 8 out of 10 characteristics. In may be concluded

that, overall, simulation users are satisfied with the simulation used. However, the users in the Alberta study, do not appear to be a homogeneous group. When the user group was split in two based on the criteria outlined in Chapter 4, significant differences in group means were obtained for 5 out of 10 characteristic. This result suggests that the users of the traditional business simulations were less satisfied than users of simulation exercises with respect to realism, reflecting Alberta business environment, reflecting Alberta business practice, and enjoyment. As mentioned in the McKenna study, the difficulty in obtaining traditional business simulation products specific to the regional economy, may influence the ratings on these first three factors. Users of simulation exercises may find the available products to be more relevant. Note that six of the seven simulation exercise users, use products that were either produced by local publishers or were developed in-house.

The users of the traditional business simulations were more satisfied than users of simulation exercises with respect to "what if" analysis. This is probably because this characteristic is very specific to a traditional business simulation; before committing to decisions in a round of play, a team usually has the option of exploring the consequences. This characteristic may not be integral to a simulation exercise. It is interesting to note that although simulation exercises have fewer rounds of play than traditional business simulations, users perceive no difference in terms of complexity.

Profile of User vs. Non-user

The typical user is a male, full-time instructor, between 46 and 50 years of age, has 13.8 years of teaching experience at the post-secondary level, has 10.5 years of full-time work experience, specializes in accounting, and teaches at a community college. The typical non-user is a male, full-time instructor, between 41 and 45 years of age, has 12.4 years of teaching experience, has 9.5 years of full-time work experience, specializes in accounting, and teaches at a technical institute. Despite the apparent differences, no significant differences resulted when comparing the user data and non-user data with respect to gender, age, experience, educational role, and type of post-secondary institution. This is a welcomed result since it means that users of business simulations are not segregated by age, type of educational institution, etc. Therefore, there is greater opportunity for a user/non-user dialogue.

Non-users reported accounting and marketing most frequently as a specialization. Nine users mentioned accounting as a discipline in which they use their simulation; four users mentioned marketing. The conclusion is that a lack of curricular fit is more of a perceived barrier to usage than an actual barrier.

There was no significant difference in computer familiarity ratings. This is an expected result since only 53.6% of users were using computer-scored simulations. Users rated their familiarity with business simulations higher than non-users. Again this is an expected result since familiarity would increase with usage.

Alberta Study vs. Faria Study

Comments have been made above regarding a comparison of the Alberta study and Faria's study with respect to current usage, previous usage, percentage of class time devoted to simulation, and percentage of course grade weighting assigned to simulation exercises. With respect to past usage, the trend from 1989 to 1994 in Alberta has been towards increased usage by users, while from 1982 to 1987 in North America the trend had been towards stabilization of use by users. This difference in trends may be due to either the different time period involved, or the different populations (one/two-year college vs. four-year university). Presumably simulation usage, especially according to a broad definition, is on the increase in Alberta. The trend for 1994 to 1999 in Alberta is also increased usage by current users. Not enough information is available to make a direct comparison on future trends with Faria's study.

Both the Alberta study and Faria's study agree that although usage has increased among users, both the percentage of class time devoted to simulation exercises and the percentage of the course grade weighting assigned to simulations, stabilized in the five years prior to each study. This may suggest that community college and technical institute instructors are now at a level of familiarity with business simulation where their approach to implementation is now predictable, rather than experimental. The four-year colleges may have reached this plateau at an earlier date due to their longer history with simulations.

The relative teaching effectiveness ratings in the two studies were similar, though business simulations fared somewhat better in the Alberta study (placing second overall vs. third). This may be indicative of the more pragmatic environment of community colleges and technical institutes, where a practical, hands on exercise is more highly valued. Burgess (1991) found that the highest academic users of business simulations were polytechnics, and attributed this to their emphasis on vocational studies. Note also that in the 1993 and 1994 Alberta BusComp, the participants were all community colleges and technical institutes; none of Alberta's four universities participated.

Faria found significant differences between users and non-users in age, teaching experience and full-time work experience; the Alberta study did not. The reason for this may be that, as mentioned earlier, the use of business simulations is not isolated to a specific segment of the community college or technical institute.

In the Alberta study, accounting and management were the most common disciplines in which a simulation is used; in Faria's study business policy and marketing were most common. Business policy is a typical university capstone course. In the community college, a senior accounting course may serve the same function. The small number of marketing simulations in the Alberta study is puzzling. It may be that the opportunity to specialize in marketing is limited in a two-year college, and therefore senior courses which would offer marketing simulations are also limited.

Conclusions and Recommendations

The following conclusions are supported by the results of the study:

1) Business simulation usage in community colleges and technical institutes in Alberta is healthy and growing. This may be attributed to the pragmatic orientation of these institutions, as well as to a broad interpretation of what constitutes a business simulation. Simulations play a prominent role in the classes in which they are used in terms of both class time and percentage of the course grade.
2) Users may be divided into two groups: traditional business simulation users and simulation exercise users. This latter group emerges when a more liberal interpretation of the term "business simulation" is applied.

3) Users now have a familiarity with business simulations where their approach to implementation is predictable, rather than experimental.
4) Play is organized in a variety of ways by business administration instructors who use business simulations. Business simulations as a whole are a flexible teaching method, employed across many disciplines.
5) Business simulations are perceived to be effective in developing skills across all basic management areas, although other teaching methods are always employed to complement the simulation.
6) Instructors in business administration programs need more information about business simulations in order to make decisions among teaching alternatives
7) Publishers need to be more responsive to the needs of instructors in terms of providing business simulations which are integrated with other teaching devices, especially textbooks, and which model the regional economy.
8) There is a need for a dialogue between users and non-users regarding the costs and benefits of business simulations. Differences in perceptions exist regarding curricular fit, enjoyment of students, and the role of computers. The opportunity for dialogue is enhanced since users are not a segregated group.

The following are recommendations for practical application:
1) If a business administration instructor is considering using a business simulation, a good source of information would be another instructor who is using or has used a simulation in the same discipline. There are approximately 67 users within community colleges and technical institutes in Alberta. There are an additional 67 previous users. Both current users and previous users may be identified through organizations such as MECCA (Management Education Coordinating Council of Alberta) or the Society of Management Accountants of Alberta.
2) In considering whether a business simulation may be applicable to a course, the instructor should remember that a broad array of simulations are available for use in business administration courses which may not conform with a traditional definition.
3) Instructors may consider adopting a non-computerized simulation. At least 35% of the simulation users identified in this study did not use a computer to score their simulation.
4) Administrators need to examine the resource requirements of innovative teaching methods such as business simulations.

Existing users need to share the outcomes with administrators to demonstrate whether the benefits exceed the costs.

The following are recommendations for further research:

1) Further research is needed into the use simulation exercises in business administration programs. These appear to be a more versatile teaching device than the traditional business simulation.
2) Research is needed into the use of business simulations in the four universities in Alberta. The results of such research could then be compared to this study.
3) This research could be expanded to include colleges and universities across Canada to determine trends in other provinces and territories.
4) Future research should clarify definitions to minimize confusion. The term business simulation needs to be clearly defined and distinguished from simulation exercise. "Computer-scored" needs to be defined, as well as what constitutes an independent seminar. Finally, what is meant by a decision in a round of simulation play needs to be clarified.
5) Future research is needed to examine the cost-effectiveness of business simulations, in terms of product development, demands on the instructor's time, and computer time.

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Appendix

A. Survey

A SURVEY OF THE USE OF BUSINESS SIMULATIONS
WITHIN COLLEGES AND TECHNICAL INSTITUTES IN ALBERTA

To answer the questions in this survey, use the following definition:

BUSINESS SIMULATION: a simulated market environment in which participants make decisions for an entire business operation (top management simulation) or for one functional area of the business (functional business simulation). In top management simulations, individuals or teams representing separate businesses compete to maximize output measures such as net profit or return on investment. In functional simulations, individuals or teams attempt to minimize costs through efficient operation of one function of the business such as production, marketing, finance, or human resources. Computers usually play a role in calculating the output measures, given the input decisions of the various individuals/teams operating in the simulated environment.

SECTION 1: PERCEIVED ADVANTAGES

1.1 Rate your familiarity with business simulations on a scale of 1 (no familiarity) to 5 (extremely familiar):

1 ❑ 3 ❑ 4 ❑ 5 ❑

1.2 Which of the following do you perceive to be advantages of business simulations as a teaching method? (Check all that apply):

1❑ enjoyable for students
2❑ inexpensive alternative to a field placement
3❑ safe environment for experimentation
4❑ realistic
5❑ provide better transfer of learning
6❑ cost little to develop
7❑ impose less threat and anxiety on students than other educational activities
8❑ teach critical thinking skills (through the use of "what if" scenarios) as well as content
9❑ encourage socialization and collaboration
10❑ maximize use of learning time (through a focus on the specific learning task)
11❑ promote incidental learning about computers and application software
12❑ other (please specify)_____
_____

PLEASE PROCEED TO SECTION 2.

SECTION 2: PERCEIVED DISADVANTAGES

2.1 Which of the following do you perceive to be disadvantages of business simulations as a teaching method? (Check all that apply):

1❑ available simulations do not reflect Alberta's economic reality
2❑ students may not realize there are substantial differences between the simulation and the real world
3❑ lack a realistic system of rewards and punishments
4❑ require too many resources (time, money, computer facilities, etc.)
5❑ take up more time than their learning objectives justify
6❑ difficulty in achieving curricular fit
7❑ demands on simulation administrator are too great
8❑ too much emphasis on competition
9❑ student computer-related problems (access, familiarity)
10❑ instructor computer-related problems (access, familiarity)
11❑ other (please specify)_____
_____

PLEASE PROCEED TO SECTION 3.

SECTION 3: PERCEIVED RELATIVE EFFECTIVENESS

3.1 From your perspective as an instructor in a business administration program, rate the effectiveness of the following teaching methods on a scale of 1 (low) to 10 (high):

Lo								Hi	
1	3	4	5	6	7	8	9	10	
❑	❑	❑	❑	❑	❑	❑	❑	❑	lectures
❑	❑	❑	❑	❑	❑	❑	❑	❑	cases
❑	❑	❑	❑	❑	❑	❑	❑	❑	business simulations
❑	❑	❑	❑	❑	❑	❑	❑	❑	readings

3.2 Have you used a business simulation in any of the courses you taught during the 1993/94 school year?

1❑ yes **IF "YES" PLEASE PROCEED TO SECTION 5 (PAGE 4)**

2❑ no **IF "NO" PLEASE PROCEED TO SECTION 4 (BELOW)**

SECTION 4: REASONS TO ADOPT/READOPT

4.1 Have you used a business simulation prior to the 1993/94 school year?

❑ yes

❑ no

4.2 What is the <u>main</u> reason you discontinued using, or have never used a business simulation? (Explain briefly below):

_____

_____

4.3 What would motivate you to adopt/readopt a business simulation as an instructional method? (Check all that apply):

1❑ more information about business simulations in general
2❑ evidence of teaching effectiveness
3❑ evidence that the use of business simulations is based on sound educational theory
4❑ opportunity to see the simulation process demonstrated
5❑ increase in quality of software
6❑ reduction in cost of software
7❑ the inclusion of qualitative factors in the decision-making process, such as employee morale, political climate, etc.
8❑ integration with the assigned textbook
9❑ less demanding of students' time
10❑ less demanding of instructor's time
11❑ better student access to/familiarity with computers
12❑ better instructor access to/familiarity with computers
13❑ other (please specify)_____
_____

4.4 Do you plan to <u>implement</u> a business simulation in the 1994/95 school year?

1❑ yes
2❑ no
3❑ not sure

4.5 Do you plan to <u>investigate</u> the use of a business simulation in the 1994/95 school year?

1❑ yes
2❑ no
3❑ not sure

PLEASE PROCEED TO SECTION 7 (PAGE 8).

SECTION 5: EXTENT OF USAGE

This section pertains to the simulation you have used during the 1993/94 school year. If you have used more than one simulation in the 1993/94 school year, answer the questions for the simulation used most recently.

5.1 Why did you adopt a simulation? (Check all that apply):

1❑ evaluation of several instructional alternatives
2❑ experience as a participant
3❑ recommendation from a colleague/professional association
4❑ used it in a similar course in another institution
5❑ recommendation from a publisher
6❑ already in use when assumed control of course
7❑ other (please specify) _____
_____

5.2 In what discipline is the simulation used? (Check one only):

1❑ business policy
2❑ marketing
3❑ finance
4❑ management
5❑ accounting
6❑ other (please specify) _____
_____

5.3 What is the nature of the program in which the simulation is used? (Check one only)

1❑ one-year certificate
2❑ two-year diploma
3❑ university transfer
4❑ extension (continuing education) - credit
5❑ extension (continuing education) - non-credit
6❑ other (please specify) _____
_____

5.4 a) How many students are registered in <u>all sections</u> of the course in which the simulation is used? ____

b) What is the average number of students in <u>each class</u> of the course in which the simulation is used? ____

5.5 a) What is the name of the business simulation you use? _____

b) How was the simulation acquired? (Check one only):

1❑ purchased off-the-shelf
2❑ purchased off-the-shelf and modified
3❑ custom designed by an outside developer
4❑ developed in-house
5❑ other (please specify):_____

c) If it was purchased, who is the publisher? _____

d) Is the business simulation you use, computer-scored?

1❑ yes
2❑ no **IF "NO" GO TO QUESTION 5.7.**

5.6 What computer hardware do you use for scoring?

1❑ mainframe
2❑ minicomputer
3❑ personal computer

5.7 How has your usage level of business simulations changed in the past 5 years?

1❑ decreased
2❑ no change
3❑ increased

5.8 How will your usage level of business simulations change in the next 5 years?

1❑ decrease
2❑ no change
3❑ increase

PLEASE PROCEED TO SECTION 6.

SECTION 6: NATURE OF USAGE

This section pertains to the course in which a simulation was used during the 1993/94 school year. If you have used a simulation in more than one course during the 1993/94 school year, answer the questions for the most recent course.

6.1 a) What percentage of the course's class time was devoted to the simulation? (If the simulation was used in an independent seminar, indicate 100%):

____% **IF "100%", GO TO QUESTION b). OTHERWISE, GO TO QUESTION c).**

b) What percentage of class time of a yearly full load of courses does the independent simulation seminar represent? ____%

c) What has been the change in the percentage indicated in question a), in the last 5 years?

1❑ decreased
2❑ no change
3❑ increased

6.2 a) What percentage of the course grade weighting is assigned to the simulation exercises? ____%

b) What has been the change in this percentage in the last 5 years?

1❑ decreased
2❑ no change
3❑ increased

6.3 Within the course, which other teaching methods are used in conjunction with simulation. (Check all that apply):

1❑ lectures
2❑ cases
3❑ readings
4❑ seminars
5❑ role-play
6❑ project
7❑ none

6.4 At what point in the course is the business simulation used? (Check one only):

1❑ at the beginning of the course as an introduction to content
2❑ at the end of the course as a wrap up
3❑ throughout the course
4❑ other (please specify)_____
_____

6.5 a) What is the minimum number of players on each team? _____

b) What is the maximum number of players on each team? _____

6.6 How many rounds of play (business cycles) are involved? _____

6.7 What is the interval between rounds? (in weeks. Note: one school day = 0.2 weeks) _____

6.8 How many team decisions per round are required? _____

6.9 Which of the following eight basic sets of management skills do you feel are developed through the use of the simulation? (Check all that apply):

1❑ peer skills
2❑ leadership skills
3❑ conflict-resolution skills
4❑ information-processing skills
5❑ skills in decision-making under ambiguity
6❑ resource-allocation skills
7❑ entrepreneurial skills
8❑ skills of introspection

6.10 Evaluate the business simulation you use by responding to the following statements on a scale of 1 (strongly disagree) to 5 (strongly agree): "The business simulation I use...

SD			SA	
1	3	4	5	
❑	❑	❑	❑	is realistic."
❑	❑	❑	❑	is complex."
❑	❑	❑	❑	reflects Alberta's business environment."
❑	❑	❑	❑	reflects Alberta's business practice."
❑	❑	❑	❑	requires participants to make a balanced decision set."
❑	❑	❑	❑	provides adequate information."
❑	❑	❑	❑	facilitates adequate 'what if' analysis."
❑	❑	❑	❑	provides an enjoyable learning experience."
❑	❑	❑	❑	results in a heavy work load for the student."
❑	❑	❑	❑	results in a high rating from students, relative to other courses."

PLEASE PROCEED TO SECTION 7.

SECTION 7: DEMOGRAPHICS

7.1 What is your gender?

1❑ male
2❑ female

7.2 What is your age?

1❑ 21-25
2❑ 26-30
3❑ 31-35
4❑ 36-40
5❑ 41-45
6❑ 46-50
7❑ 51-55
8❑ 56-60
9❑ 61-65
10❑ 66-70

7.3 How many years of teaching experience at the post-secondary level do you have? ____

7.4 How many years of full-time work experience do you have, outside of teaching? ____

7.5 Which of the following <u>best</u> describes your role within your educational institution? (Check one only):

1❑ full-time instructor
2❑ full-time administrator
3❑ part-time administrator/part-time instructor
4❑ part-time instructor
5❑ part-time administrator
6❑ other (please specify)_____
_____

7.6 What is your area(s) of specialization? (Check all that apply):

1❑ accounting
2❑ economics
3❑ finance
4❑ business computing
5❑ human resources
6❑ marketing
7❑ organizational behavior
8❑ other (please specify)_____
_____

7.7 At what type of educational institution do you teach?

1❑ community college (public)
2❑ private college
3❑ technical institute (public)
4❑ other (please specify)_____
_____

7.8 Rate your familiarity with computers and application software on a scale of 1 (no familiarity) to 5 (extremely familiar):

1 3 4 5
❑ ❑ ❑ ❑

7.9 Please feel free to add your comments on the use of business simulations as an instructional method, or on this questionnaire in general.

_____
_____
_____
_____
_____

This completes the questionnaire. Thank you for your participation.

Appendix

B. Covering Letter

ACT Education

May 9, 1994

Dear business instructor:

I am inviting you to complete the enclosed questionnaire as part of a study into the use of business simulations in post-secondary business education in Alberta. This study of both users and non-users, concerns the extent and nature of usage, perceived advantages and disadvantages, and perceived relative teaching effectiveness of business simulations. It is anticipated that this information will assist business instructors in assessing the value of pursuing a simulation-based teaching strategy. I am conducting the study in partial fulfillment of requirements to receive a Master's in Education degree.

Instructors in business administration or related programs, at all colleges and technical institutes have been asked to respond to the survey.

Your answers to the questions are strictly confidential; all analyses will be reported in terms of aggregate statistics. You are under no obligation to participate. Furthermore, you may withdraw from the study at any time. However, I do encourage you to help me obtain accurate information by completing the survey.

Please note: Users of business simulations are requested to complete all sections except Section 4. Non-users are requested to complete all sections except Sections 5 and 6.

Thank you for completing the questionnaire. Please return it to me through the provincial government courier, in the enclosed envelop

by May 27, 1994. A summary of the results will be distributed to participating department heads in September. If you would like your own copy of results or if you have any questions, please call me at the number below.

Sincerely,

Stephen Lamoureux (428-0703)

CC: Dr. Michael Szabo, Thesis Supervisor
Enclosure

Appendix

C. Reminder Letter

Adult, Career, and Technology Education
University of Alberta
Edmonton, Alberta T6G 2G5

May 24, 1994

Dear business instructor:

Two weeks ago I sent a questionnaire to you as part of a study into the use of business simulations in post-secondary education in Alberta. I am conducting this study in partial fulfillment of requirements to receive a Master's of Education degree. I would encourage you at this time to complete the questionnaire, if you haven't already done so. Remember, both users and non-users of business simulations are requested to complete the questionnaire. It is anticipated that the information from this study will assist business instructors in assessing the value of pursuing a simulation-based teaching strategy.

I assure you that your answers to the questions are strictly confidential; all analyses will be reported in terms of aggregate statistics. You are under no obligation to participate. Furthermore, you may withdraw from the study at any time. However, I do encourage you to help me obtain accurate information by completing the survey.

Note: Non-users are required to complete 4 & 1/2 pages of the survey (10 minutes maximum) while users are required to complete 8 pages (20 minutes maximum).

Once the questionnaire is completed, please return it to me by provincial government courier in the envelop that was enclosed with

it. If you need a second questionnaire or if you have any questions, please leave me a message at the number below.

Sincerely,

Stephen Lamoureux, B.Comm. (428-0703)

CC: Dr. Michael Szabo, Thesis Supervisor

Appendix

D. Survey Sample

Alberta College	
Business Administration and Junior Accounting	6
AVC - Lac La Biche	
Business Administration	4
AVC - Lesser Slave Lake	
Business Administration	3
Canadian Union College	
Bachelor of Business Administration	4
Concordia College	3(-1)
Fairview College	
Business programs - Fairview	8(-1)
Business programs - Peace River	3
Grande Prairie Regional College	
Business Administration	8
Grant MacEwan Community College	
Accounting	8
Accredited Accounting	1
Management Studies	18
Keyano College	
Business Administration	8
King's University College	
Business	2(-1)
Lakeland College	
Business Administration - Lloydminster	9
Business Administration - Vermilion	9
Lethbridge Community College	
Business Administration	13
Medicine Hat College	
Business Administration	10
Mount Royal College	
Business Administration	14
NAIT	
Accounting and Finance	30

Business Administration - Year 1	29(-1)
Management and Marketing	23
Olds College	
Agricultural Business	4
Red Deer College	
Bachelor of Commerce transfer/Business Administration	9
SAIT	
Business Administration	51
Total Number of Business Instructors Surveyed:	277(-4)

Note: The bracketed figures represent surveys that were returned, with some indication that the instructor had not taught during the past year and therefore was not part of the population.